KBU 64

User Manual

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Pan European Approval:

Where the Pan European Approval CE Mark '168X' is applied to the product; this approval is for connection of the ISDN and X.21 interfaces within the European Community (EC).

Where an EC country requires approval for connection of the V35 or V24 Link ports to a PTO's Digital Leased Circuit (DLC), this approval is necessary in that country before connection to the DLC can be permitted.

Approval in non EC countries is subject to local regulations in force, please contact your Technical Support for information.

EMC Directive:

This product has been designed for use in Commercial and Light Industrial environments and tested to relevant EMC Standards as listed in the European O.J. All testing was carried out using screened interconnection cables. Should the equipment be used in a different environment the user may need to take additional EMC precautions.

Rackmount unit: the supplied metal front cover must be fitted to meet the EMC standards when the rack is installed.

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1.

This is the KBU 64

1.1 Introduction

The KBU 64 Kilostream Backup Unit provides an effective, easy to implement, automatic backup for X21 Kilostream or other leased digital data circuits, over the ISDN (Integrated Services Digital Network).

ISDN is a public switched digital network, enabling simultaneous multi-service connection over a single pipe, consisting of two 64Kbit/s streams and one 16Kbit/s control channel.

The KBU 64 is available either as a dual channel device (offering backup facilities to two independent 64Kbit/s lines, or one 128Kbit/s line when used in conjunction with a Fivemere MCX 128 multiplexer). It is also available as a Rackmount version which allows up to a maximum of 13 units (i.e. 13 X Dual-Channel KBU 64s), each offering the same facilities already discussed.

The KBU 64 is designed to sit in the data path between the Kilostream Network Termination Unit (NTU) and your user equipment, see Figure 1.1.

Full details of the rackmounted KBU 64 are provided in KBU 64 User Manual 80-10100001.

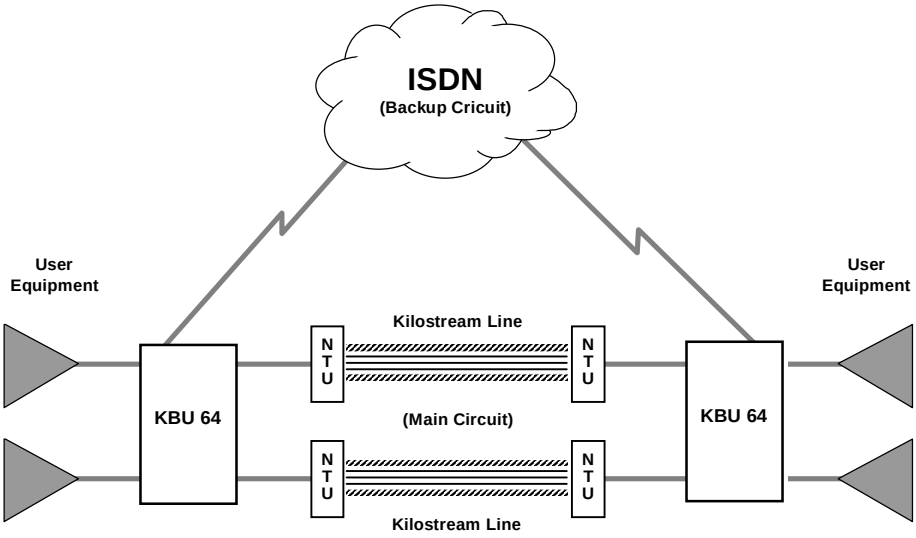


Figure 1.1 KBU 64 sits in the data path

During normal operating conditions, user data passes over the Kilostream link in the normal manner, with the KBU 64 remaining transparent to the system. If a failure occurs on the Kilostream line, this is detected by the KBU 64. After a user defined elapsed time, the KBU 64 dials a remote KBU 64 via the ISDN line . Upon verification of an acceptable connection the data is then re-directed over this backup path at 64Kbits per second.

Kilostream backup operation is user configured for either automatic or manual initiation. While the backup data circuit is in use the KBU 64 monitors the failed Kilostream line and upon detection of its recovery clears the ISDN call, when data is returned to the Kilostream line (main leased circuit).

1.2 Features

The main features include:

- Independent operation of the two main circuit channels.
- Rack mountable, up to 13 KBU 64s in one standard 482mm X 400mm X 370mm rack.
- Support for synchronous data rates of 600, 1K2, 2K4, 4K8, 9K6, 19K2, 38K4, 48K, 56K, 64Kbit/s.
- Support for asynchronous data rates of 300, 600, 1K2, 2K4, 4K8, 9K6, 19K2, 38K4 bit/s.
- Asynchronous word lengths of 7, 8, 9, 10, 11 & 12 bits.
- Automatic fault detection on the Kilostream circuits.
- Fully automatic or manually initiated dialling and backup of a Kilostream Link.
- Local or remote control of the switch to a backup circuit.
- Fully automatic or manually initiated restoral to the main circuit.
- Automatic re-dial and alternate number dialling.
- Fail-safe main circuit routing.
- Storage of 99 ISDN telephone numbers for each of the two ISDN channels, including a 5 digit sub-address number.
- User definable line failure detection modes.
- Remote Configuration and monitoring.
- Command line user interface.
- Line integrity testing, both manual and automatic.
- ‘Alarm’ output port for event logging, printing.
- Relay contact output for alarm indication.
- Security using Calling Line Identification.
- ‘Pass Through’ relays in the event of a power loss.
- Talkwire compatibility with 6421 (with compatible 6421 software).
- Password protected command interface.
- Multiple Time Windows automatic back up operation.

1.3 Product Overview

This user manual is arranged to take you through the basics of correct hardware configuration and installation, then to software set-up and on to the more specialised user definable software facilities of your KBU 64.

KBU 64 software configuration is generally not a complex operation. In many applications once you have correctly configured the hardware and installed your KBU 64s, the default software configuration settings will suffice to provide reliable backup operation.

In section 4 of this manual we provide a general guide, detailing a number of typical applications for the KBU 64 and outlining typical configurations for use with each of these applications.

In this section we give a brief overview of many of the more specialised, software configurable, features of your Kilostream backup unit. Each topic is dealt with in detail in this manual.

1.3.1 Network Security

Your KBU 64 contains an integral security facility, designed to protect it from being accessed by unauthorised users via the ISDN.

If the security option is enabled (ANSWER is set to CLID), the answering KBU 64 will only accept a call originating from an ISDN number matching one of those stored on its file of telephone numbers.

1.3.2 Telephone Number Storage

The non volatile memory will store up to 99 telephone numbers, allowing you to select a backup telephone number for any particular circuit. Alternative numbers can be dialled in the event of an unsuccessful call.

1.3.3 Circuit Failure

Your KBU 64 can detect a circuit failure if it detects any of the following conditions:

- No data is received from the Kilostream link.
- No clock is detected on the link.
- The I/DSR signal from the Kilostream NTU goes to the OFF condition.
- The C/DTR signal from the User DTE equipment goes to the ON condition.

User selectable time-outs can be independently set for all of the detection facilities mentioned, except C/DTR from the DTE.

1.3.4 Talkwire

Talkwire is the facility which enables remote control and configuration of a KBU 64, either over the ISDN network (if data is being routed over the Kilostream link) or over the Kilostream link (if data is being routed over the ISDN line).

As this feature allows you access to all KBU 64s connected to the ISDN (providing you have the correct telephone number), the KBU 64 supports the Network provided Calling Line Identification facility for enhanced security.

1.3.5 Polling

In a large network of KBU 64s, all units can be interconnected and controlled using a single terminal.

A “poll” number can be set for each unit within the group, allowing individual KBU 64s to be accessed from the terminal by using the poll numbering system.

1.3.6 Alarms

Various alarm conditions are available that alert the user to the KBU alarm status. For example, incoming calls can be programmed to cause an alarm, also failure to connect a call may cause an alarm.

You can also define which of these EVENTs you want to be output as an alert via the ALARM port. An alarm message can be programmed to occur when security access is denied.

2.

Hardware Configuration

2.1 Introduction

The majority of KBU 64 configuration options are software controlled, and settings can easily be altered after the unit is installed in the system.

However the physical interface characteristics of the USER and LINK ports (correct definition is crucial to the operation of your Kilostream backup unit) are defined using hardware links which are not accessible without removing the outer casing of the unit.

Although we detail these link configurations, the required settings should have been selected at installation of your Kilostream backup unit. They must **only** be altered by your supplier or installation engineer.

WARNING. Access to the internal workings of your KBU 64 is strictly denied to all users, and may only be performed by suitably qualified personnel. Any attempt to remove the outer casing of your Kilostream backup unit will invalidate its approval.

Zone dangereuse! reservée au personnel autorisé. Ne pas ouvrir. Tensions dangereuses.

Gefäh! Bereich. Nur für fachpersonal. Nicht öffnen berührungsgefahr!

Pericole! Solo personale addestrato. Non aprire. Tensioni pericolase all 'interno.

Area peligrosa solo personal mantenimiento. No abrir. Tension. Peligrosa.

Area perigosa somente pessoal técnico treinado. Não abra. Voltagens perigosas no interior.

Farligt område endast för utbildad personal. Öppna ej. Farlig spanning inuti.

Farligt område. Kun adgang for teknisk uddannet personale. Farlig spænding indeni. Luk ikke op.

Vaarallinen alue vain koulutetulle huoltohenkilöstölle. Vaarallinen jännite. Alã avaa.

Fare - Må ikke åpnes. Farlige spenninger innenfor.

Gevaarlijk. Toogang alleen voor onderhoudspersoneel. Niet openen. Gevaarlijke voltages.

2.2 Kilostream Interface Characteristics

The Kilostream service provided in the United Kingdom is a full duplex leased line, with X21 or X21bis customer interface.
NOTE: 'Kilostream' is a generic term, referring to any X21 or X21bis non-switched service.

X21 and X21bis include V11, V35 and V24 as electrical interface options. Your KBU 64 has been designed to enable compatibility with any of these electrical variants, through the same 15-pin D-type connector. The option required is controlled by plug-in links on the main circuit board of the unit.

The link settings for both the 'USER' and 'LINK' connectors must be set to reflect the electrical interface characteristics supplied on the data link in which they sit. For example: If the link between your channel 1 NTU and the user equipment requires a V35 option then the connectors USER 1 and LINK 1 must have their links set to V35.

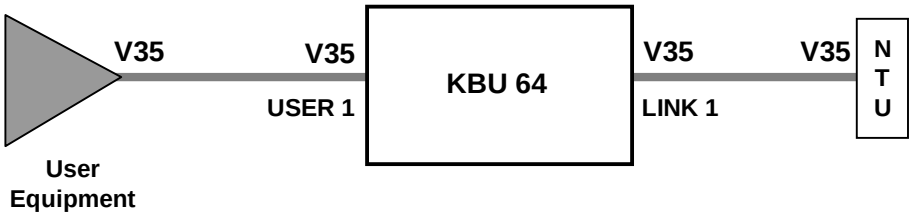


Figure 2.1 Interface denomination

Adapter cables are required for connecting from your KBU 64 to the NTU or user equipment because each of the interface variants transmit control signals through different physical pins, often using different pin numbers in a standard connector housing.

Adapter cable specifications are detailed in section 10 and are available from your KBU 64 supplier.

Several shorting links are required to select V11, V35 or V24/V28. These are standard 2-way items which electrically connect two adjacent pins on the link banks.

Figure 2.2 overleaf shows each of the connectors on your KBU 64, and shows the location of their relevant link banks;

Link bank	Connector
A	USER 1
B	LINK 1
C	USER 2
D	LINK 2

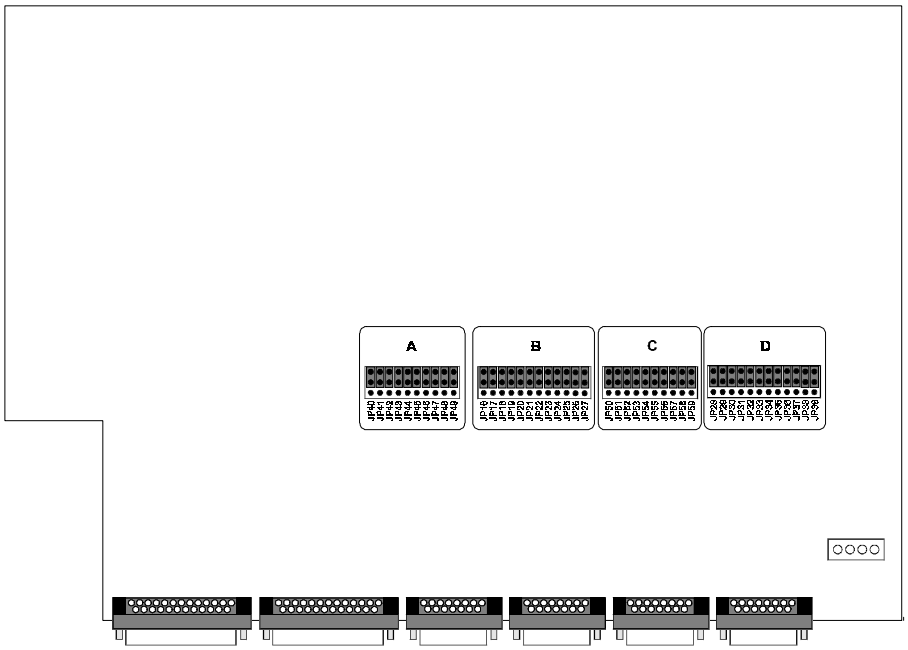


Figure 2.2 Interface link banks

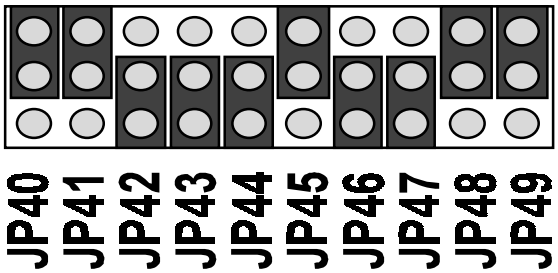
In sections 2.2.1 to 2.2.4, we individually detail the link settings for each electrical variant: the diagrams represent the component side of the main PCB. The link references in the diagrams are as marked on the PCB itself.

2.2.1 USER 1 Interface Characteristics

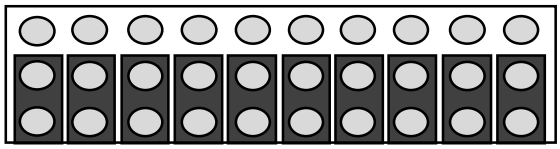
Figure 2.3 details the link settings required for the three interface options available (as viewed with the front panel LEDs furthest from you). Remember USER 1 is the user connected port for your Kilostream channel 1 (connection via LINK 1), and as such it must be configured to have the same interface characteristics as LINK 1.

The cable requirements are shown in section 10.

V35 operation



V28 operation



V11 operation

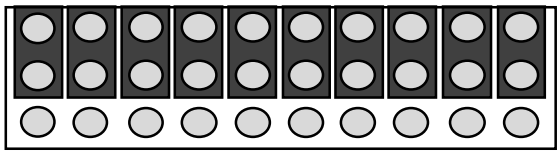


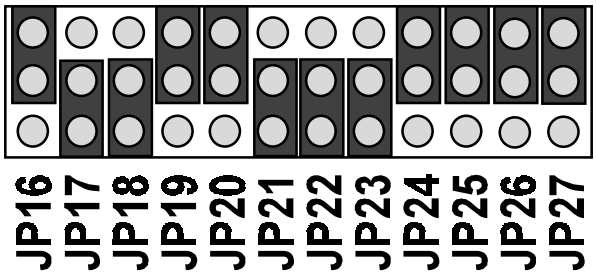
Figure 2.3 USER 1 interface link settings

2.2.2 LINK 1 Interface Characteristics

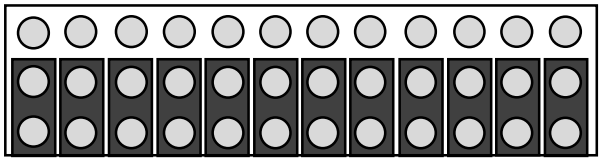
Figure 2.4 details the link settings required for the three interface options available (as viewed with the front panel LEDs furthest from you). Remember LINK 1 is the output port to your Kilostream channel 1 (input via USER 1), and as such it must be configured to have the same interface characteristics as USER 1.

The cable requirements are shown in section 10.

V35 operation



V28 operation



V11 operation

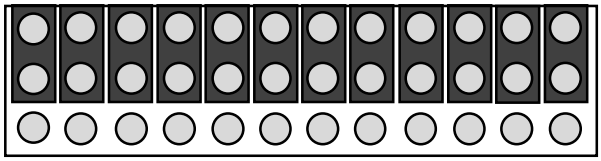


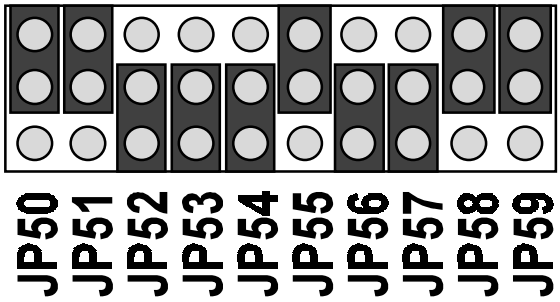
Figure 2.4 LINK 1 interface link settings

2.2.3 USER 2 Interface Characteristics

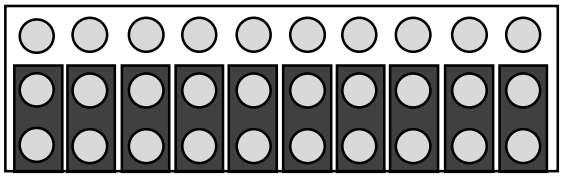
Figure 2.5 details the link settings required for the three interface options available (as viewed with the front panel LEDs furthest from you). Remember USER 2 is the input port for your Kilostream channel 2 (output via LINK 2), and as such it must be configured to have the same interface characteristics as LINK 2.

The cable requirements are shown in section 10.

V35 operation



V28 operation



V11 operation

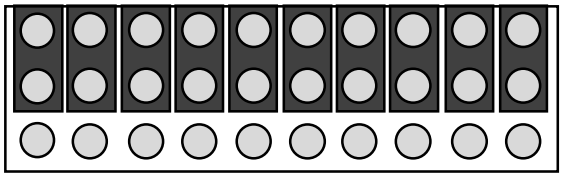


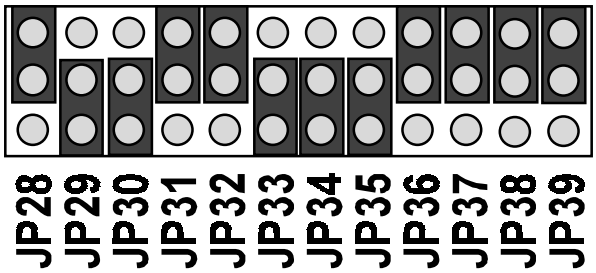
Figure 2.5 USER 2 interface link settings

2.2.4 LINK 2 Interface Characteristics

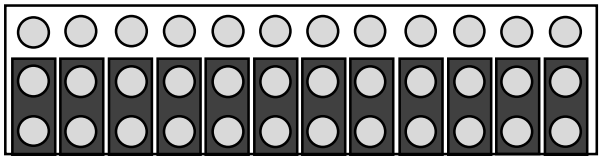
Figure 2.6 details the link settings required for the three interface options available (as viewed with the front panel LEDs furthest from you). Remember LINK 2 is the output port to your Kilostream channel 2 (input via USER 2), and as such it must be configured to have the same interface characteristics as USER 2.

The cable requirements are shown in section 10.

V35 operation



V28 operation



V11 operation

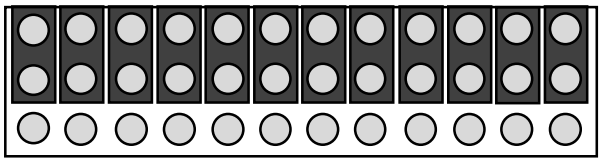


Figure 2.6 LINK 2 interface link settings

2.2.5 Interface Pin Assignments

Pin assignments of the 15-way USER and LINK connectors will vary with the link settings for the electrical interface characteristic defined in sections 2.2.1 to 2.2.4.

The USER ports are configured as physical DCEs and the LINK ports are configured as physical DTEs. Their pin assignments are:

V35 operation

Pin No.	Circuit No.	Signal Name
1	GND	Signal ground/chassis earth/ground
2	103A	Transmit Data A
3	108	Data Terminal Ready
4	104A	Receive Data A
5	107	Data Set Ready
6	114A	Transmit Clock A
7	115A	Receive Clock A
8	GND	Signal Ground
9	103B	Transmit Data B
10	105	Request To Send
11	104B	Receive Data B
12	109	Data Carrier Detect
13	114B	Transmit Clock B
14	115B	Receive Clock B
15	106	Clear to Send

See section 2.2.6 for details of Pin 1 nomination (signal ground or chassis earth/ground).

V28 operation

Pin No.	Circuit No.	Signal Name
1	GND	Signal ground/chassis earth/ground
2	103	Transmit Data
3	108	Data Terminal Ready
4	104	Receive Data
5	107	Data Set Ready
6	114	Transmit Clock
7	115	Receive Clock
8	GND	Signal Ground
9	—	not used
10	105	Request To Send
11	—	not used
12	109	Data Carrier Detect
13-14	—	not used
15	106	Clear to send

See section 2.2.6 for details of Pin 1 nomination (signal ground or chassis earth/ground).

V11 operation

Pin No.	Circuit No.	Signal Name
1	GND	Signal ground/chassis earth/ground
3	CA	Control A
4	RA	Receive A
5	IA	Indicate A
6	SA	Signal Element Timing A
7	—	not used
8	GND	Signal Ground
9	TB	Transmit B
10	CB	Control B
11	RB	Receive B
12	IB	Indicate B
13	SB	Signal Element Timing B
14-15	—	not used

See section 2.2.6 for details of Pin 1 nomination (signal ground or chassis earth/ground), factory default setting assumes no links fitted.

2.2.6 USER/LINK Pin 1 Definition

Pin 1 on the 15-way USER and LINK connectors is defined using PCB link settings as either chassis earth/ground or signal ground. Figure 2.7 shows each of the 15-pin connectors on your KBU 64, and details the location of the shorting links used.

Shorting Link	Connector	Pin definition
JP7	LINK 1	Signal ground
JP8	LINK 1	Chassis earth/ground
JP9	USER 1	Signal ground
JP10	USER 1	Chassis earth/ground
JP11	LINK 2	Signal ground
JP12	LINK 2	Chassis earth/ground
JP13	USER 2	Signal ground
JP14	USER 2	Chassis earth/ground

Note: Only fit a single link in each pair.

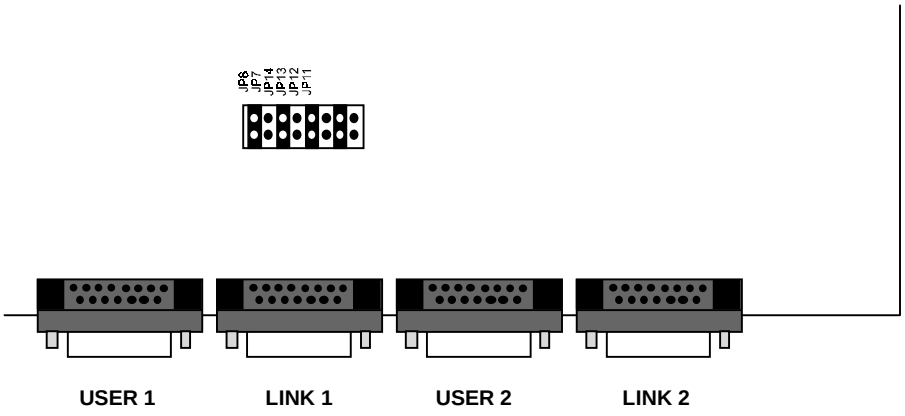


Figure 2.7 USER/LINK Pin 1 Link Bank

2.2.7 CTS Links

JP76 and JP77 when fitted provide a V28 level CTS output on pin 15 for channel 1 and channel 2 respectively. If a 1 to 1 fully connected cable is used with an X21 interface, these links should be removed; otherwise they can be left in.

2.3 Command Terminal Access

Software configuration and control of your KBU 64 is achieved via the COMMAND port on the rear panel, using a local terminal, modem or PC. The port is configured as a physical DCE, the default terminal standard is VT100, with data transfer at 9600 bit/s, no parity, 8 data bits, 1 start and 1 or 2 stop bits. This data rate can be altered by software command.

PCB shorting link options are used to select between chassis earth/ground and signal ground (through pin 1 of the 25-pin connector).

RTS/CTS loopback link options are also provided.

Refer to section 12 for details of the factory default and user definable settings available.

2.4 ALARM Port Configuration

The ALARM port located on the rear panel of KBU 64 is used for transmitting alert messages to a local terminal, modem or printer.

The default setting is 2400 bit/s, no parity, 8 data bits, 1 start bit and 1 or 2 stop bits. This data rate can be altered by software command.

PCB shorting link options are used to select between chassis earth/ground and signal ground (through pin 1 of the 25-pin connector).

RTS/CTS loopback link options are also provided. Refer to section 12 for details of the default and user definable settings available.

2.5 D.I.L. Switch Settings

2.5.1 Product Variant - Poles 5-8

Different operational modes or product “variants” can be selected via p.c.b. D.I.L. switches on the pcb, allowing several different countries and variants to use the same EPROM set.

D.I.L. switch S1 poles 5, 6, 7 and 8 define the variant in binary notation.

Pole 5 = L.S.B., pole 8 = M.S.B., (L.S.B.=Least Significant Bit, M.S.B.=Most Significant Bit).

Several software variants are available and selectable as follows:- **Please note that the variant number allocation has changed from earlier KBU 64s using V4.25 (or earlier) software.**

Variant	Country	DIL Switch Settings
Variant 0	Euro ISDN. UK and most European countries:	poles 5,6,7,8 all ON.
Variant 1	Japan:	pole 5 OFF, poles 6,7,8 ON.
Variant 2	Euro ISDN*. France and Sweden:	pole 6 OFF, poles 5,7,8 ON.
Variant 3	USA AT&T:	poles 5,6 OFF, poles 7,8 ON.
Variant 4	Italian special; fixed ISDN TEI of 0:	pole 7 OFF poles 5,6,8 ON
Variant 5	Italy: Calling Number information ISDN presentation	poles 5,7 OFF poles 6,8 ON
Variant 6	Australia:	poles 6,7 OFF poles 5,8 ON
Variant 7	USA Belcore/National ISDN 1 (SPID):	poles 5,6,7 OFF pole 8 ON
Variant 15	Reserved for UK special customer application:	poles 5,6,7,8 all OFF.

NOTE: Variant 2 does not have single octet information elements present in the call setup message.
Most other countries with Euro-ISDN are likely to require Variant 0. Please contact your Technical Support for further information.

NOTE: Variants 1-14 must not be set in the UK, otherwise the Approval of this product will be invalidated. Access to the interior to change these settings must only be made by a competent engineer.

Zone dangereuse! reservée au personnel autorisé. Ne pas ouvrir. Tensions dangereuses.

Gefäh! Bereich. Nur für fachpersonal. Nicht öffnen berührungsgefahr!

Pericole! Solo personale addestrato. Non aprire. Tensioni pericolase all 'interno.

Area peligrosa solo personal mantenimiento. No abrir. Tension. Peligrosa.

Area perigosa somente pessoal técnico treinado. Não abra. Voltagens perigosas no interior.

Farligt område endast för utbildad personal. Öppna ej. Farlig spanning inuti.

Farligt område. Kun adgang for teknisk uddannet personale. Farlig spænding indeni. Luk ikke op.

Vaarallinen alue vain koulutetulle huoltohenkilöstölle. Vaarallinen jännite. Alã avaa.

Fare - Må ikke åpnes. Farlige spenninger innenfor.

Gevaarlijk. Toogang alleen voor onderhoudspersoneel. Niet openen. Gevaarlijke voltages.

2.5.2 Poles 1- 4

Pole 1 - (default 'OFF', providing auto re-set of the Alarm port to 2400 bit/s, and the Command port to 9600 bit/s during reset after a power failure) in the 'ON' position sets both the Alarm and Command ports to 2400 bit/s upon reset.

Poles 2 & 4 - Are not Used.

Pole 3 - Must be 'ON' for all UK and European ISDN applications, where 'Power Source 1' detection is a regulatory requirement. Where 'Power Source 1' is not provided, pole 3 must be 'OFF'.

Presence of 'Power Source 1' is where 40V DC power is applied by the network between the transmit and receive 'S' bus pairs. Enabling power source detection (pole 3 'ON') means that line power must be present before calls can be made or received.

All DIP switches will be set during manufacture and must not be changed.

It is possible that a designated "country" variant could be used in another country if approvals in that country permit it.

The variant that is set can be read by using the `'VERSION'` command.

If a KBU 64 is upgraded with later software, please contact your local Technical Support organization for further information.

3.

The Front & Rear Panel Descriptions

3.1 Rear Panel - Introduction

KBU 64 is a standalone unit designed to sit on a desktop, or a shelf in a standard communications cabinet. All physical connections are made by connectors (fitted with 4-40 screw-locks top and bottom), or from a fixed cable, on the rear panel, see Figure 3.1

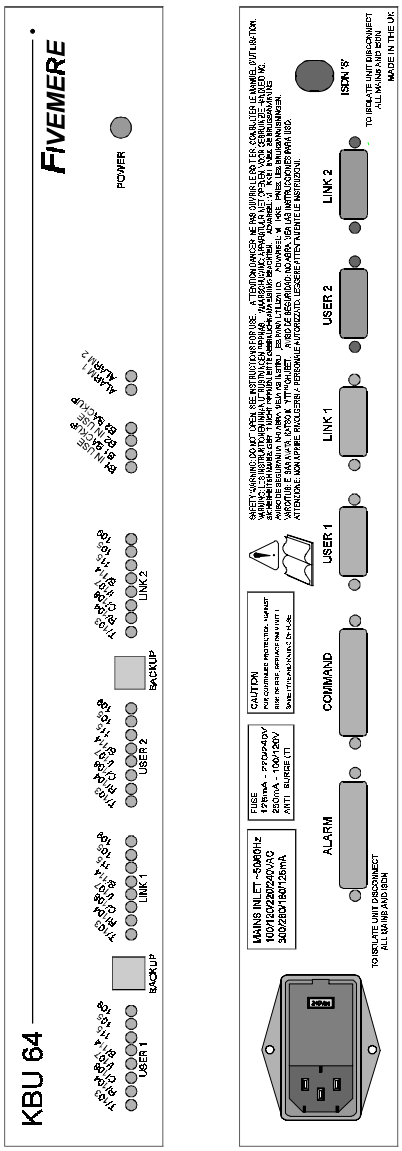


Figure 3.1 The KBU 64 Front and Rear Panels

3.2 COMMAND

A 25 pin female D-Type V24/48 interface connector provides connection to your local terminal, PC, or modem for software configuration control.

The port is configured as a physical DCE operating at a fixed rate (9600 bit/s, no parity, 8 data bits, 1 start and 1 or 2 stop bits. Port data rate can be altered by software command.

3.2.1 COMMAND Port Pin assignments

Pin assignments on the 25-way connector are:

Pin no.	Circuit no	Circuit name	Source
1	GND	Signal ground/chassis earth/ground	
2	103	Transmit Data	DTE
3	104	Receive Data	DCE
4	105	Request To Send	DTE
5	106	Clear To Send	DCE
6	107	Data Set Ready	DCE
7	102	Signal Ground	
8	109	Data Carrier Detect	DCE
9 -19	Not used		
20	108/2	Data Terminal Ready	DTE
21-25	Not used		

See section 12 for details of Pin 1 nomination (signal ground or chassis earth/ground), factory default setting is chassis earth/ground with no grounding links fitted.

3.3 ALARM

The alarm facility is provided via a 25-pin female D-type V24/V28 interface connector which allows for connection to your local printer or alarm management system.

The port is configured as a physical DCE, operating at a default rate of 2400 bit/s, no parity, 8 data bits, 1 start bit and 1 or 2 stop bits.

The data rate of the port can be altered by software command.

3.3.1 ALARM Port Pin Assignments

Pin assignments on the 25-way connector are:

Pin no.	Circuit no	Circuit name	Source
1	GND	Signal ground/chassis earth/ground	
2	103	Transmit Data	DTE
3	104	Receive Data	DCE
4	105	Request To Send	DTE
5	106	Clear To Send	DCE
6	107	Data Set Ready	DCE
7	102	Signal Ground	
8	109	Data Carrier Detect	DCE
9	---	Alarm Relay Contact	---
10	---	Alarm Relay Contact	---
11	---	Alarm Relay Contact	---
12	---	Alarm Relay Contact	---
13	---	Alarm Relay Contact	---
14-19	Not used		
20	108/2	Data Terminal Ready	DTE
21	---	Alarm Relay Contact	---
22	Not used		
23	---	Alarm Relay Contact	---
24	---	Alarm Relay Contact	---
25	---	Alarm Relay Contact	---

See section 12 for details of Pin 1 nomination (signal ground or chassis earth/ground), factory default setting is with no grounding links fitted.

3.3.2 ALARM Relays

Each channel energises an alarm relay when an alarm condition arises. This has the same functionality as the alarm LEDs on the front panel i.e. whenever an alarm LED is illuminated or flashing, the corresponding alarm relay is energised.

Each relay has two contact sets, one set from each relay is directly connected to the alarm port, the other set from each relay is connected together to form a combined alarm output relating to both channels.

Below is a truth table of the Alarm port interface pins that are connected by the relay contacts when an alarm occurs:

	B1 Alarm	B2 Alarm	Pins connected on Alarm Port
1.	No	No	12-13, 9-21, 23-11
2.	Yes	No	12-25, 9-10, 23-11
3.	Yes	Yes	12-25, 9-10, 23-24
4.	No	Yes	12-13, 9-10, 23-24

3.4 USER and LINK

The KBU 64 has been designed so as to permit the user to insert the unit between the user equipment and the Kilostream NTU. To maintain the simplicity of this system, the USER ports are defined as physical DCEs and the LINK ports as physical DTEs.

With the unit switched off, or in the event of a power failure, USER 1 is connected directly to LINK 1 and USER 2 to LINK 2 via relay contacts. When your Kilostream backup unit is powered on, the relays are switched causing direct connection to be broken, whilst the signals are routed through the interface receivers and transmitters of your KBU 64.

The KBU 64 is a dual channel device offering independent control through each channel. These are physically separated as: USER 1 to LINK 1 and USER 2 to LINK 2. The USER interface is for connection between your user equipment and the KBU 64, the corresponding LINK interface connects to the Kilostream NTU (see Figure 3.2).

All operating parameters, such as speed, data, parity etc., are software defined. Settings may be altered using a terminal connected to the COMMAND port.

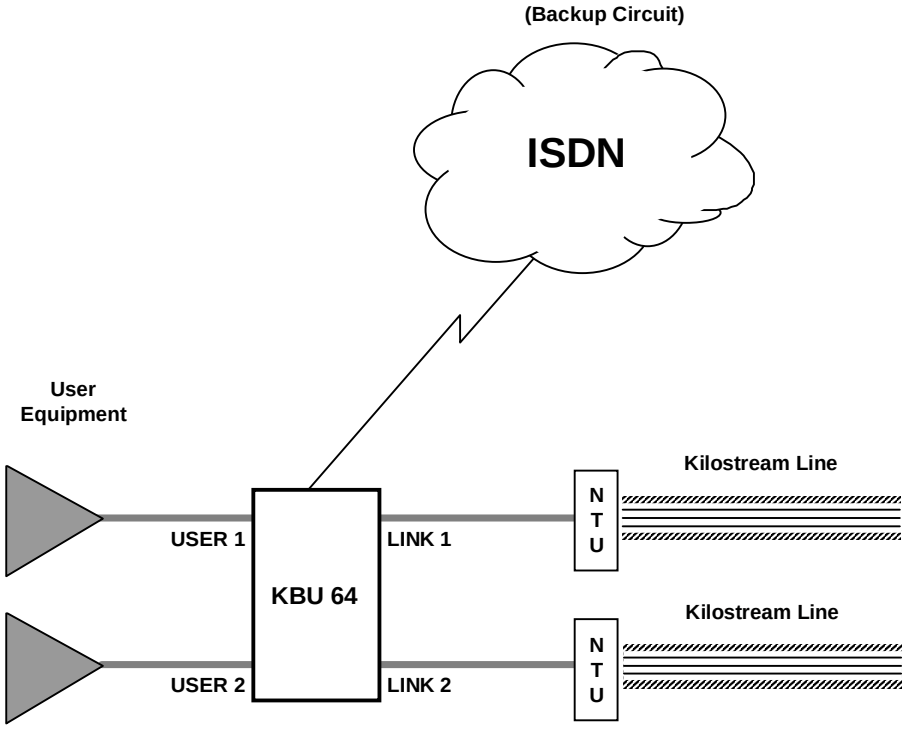


Figure 3.2 USER/LINK relationships

3.4.1 USER and LINK Pin Assignments

In section 2 of this manual we detailed the various electrical characteristics supported by your Kilostream backup unit.

Selecting these options will alter the control signals, received or transmitted on any particular pin of the D-type connectors, thus requiring different cable configurations to achieve a successful connection.

You should refer to 10 for details of the adaptor cables required for connecting to these ports.

3.5 ISDN

A fixed lead and plug is supplied for connection to your ISDN outlet, providing two 64Kbit/s channels.

In the UK, the ISDN access point (NT1) has two sockets. The sockets are internally connected to each other so either may be used for the KBU 64

When a KBU 64 is connected to an ISDN network, the network assigns an address, called the Terminal Endpoint Identifier, to the KBU 64. To prevent the network becoming confused if KBU 64 devices are powered OFF or exchanged, at least 30 seconds should elapse between plugging a KBU 64 into the NT1 and powering ON the KBU 64.

See Figure 3.3 below for details of the RJ45 pin numbering.

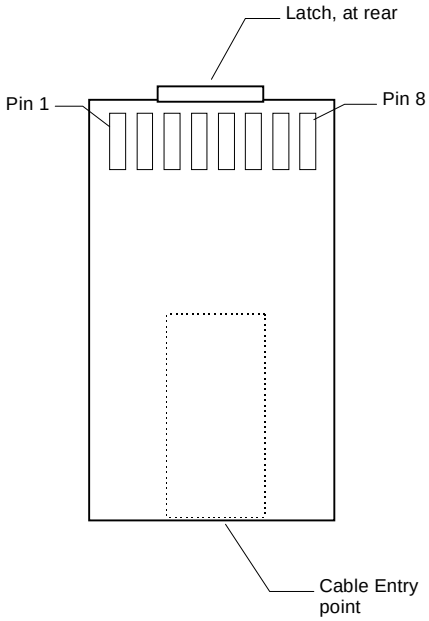


Figure 3.3 RJ45 Connector showing pin connections

The pin assignment on the RJ45 is with pin 1 on the left, with the plug pins facing you and the cable entry pointing downwards.

3.5.1 Basic Rate S (Europe) Interface

The KBU 64 is supplied in countries other than the USA the following pins are used in the RJ45 connector:

RJ45	Wire Colour	Signal
pin 3	White	Transmit
pin 4	Green	Receive
pin 5	Blue	Receive
pin 6	Red	Transmit

3.5.2 Basic Rate U (USA) interface

When the KBU 64 is supplied with a USA 'U' Interface, the following pins are used in the RJ45 connector:

RJ45	Wire Colour
pin 4	Green
pin 5	Blue

3.6 Mains Input and Fuse Housing

SAFETY WARNING:

Before connecting the mains supply to the unit, check the supply voltage setting as detailed in section 3.6.1.

On the rear of the unit is a single IEC mains plug for connection to the mains supply. The primary earth/ground connection is made via this connection.

WARNING — THIS APPLIANCE MUST BE EARTHED/ GROUNDED.

VORSICHT - Nur eine vorschriftsmäßig geerdete Steckdose anschließen.

PRECAUCION - Conectar a una toma de corriente con derivación a tierra.

VARNING - Anslut endast till jordal utlag.

ADVARSEL - Bruk jordet stikkontakt.

ATENÇÃO - Ligue a uma tomada eléctrica ligada à terra.

ATTENTION - Utillisez une prise correctement mise à la terre.

AVVERTENZA - Insertre in una presa di corrente collegata a massa.

VAROITUS - Kytke maatettuun pistorasiaan.

LET OP! - Aanslulten op randgeaarde contactdoos.

NB! - Slut till on korrekt jordforbundet stikkontakt.

IMPORTANT:

A single mains cable is supplied with the KBU 64, 2 metres in length with an appropriate approved plug for the country concerned. This should be connected to a suitable mains supply. The mains plug is the primary disconnect device for the unit. Ensure that the unit is installed near to a socket outlet and that the outlet is easily accessible.

N.B. The use of adaptors is not recommended and may invalidate approval of the product.

The wires in the supply cord are coloured in accordance with the following code:

Colour	Connection
Green and yellow	Earth/ground
Blue	Neutral
Brown	Live

As these colours may not correspond with the terminations in the plug being used, it should be connected as follows:

The green and yellow wire must be connected to the earth/ground terminal marked with a letter E, or with the earth/ground symbol, or coloured green, or coloured green and yellow.

The blue wire must be connected to the neutral terminal marked with the letter N, or coloured blue.

The brown wire must be connected to the line terminal marked with the letter **L**, or coloured **brown**, or **red**.

3.6.1 Voltage Selection

The KBU 64 can be connected to voltage supplies of:

- 90V AC to 110V AC (100V Nominal)
- 108V AC to 132V AC (120V Nominal)
- 198V AC to 242V AC (220V Nominal)
- 216V AC to 264V AC (240V Nominal)

Supply frequencies, in all cases, must be in the range 47Hz to 63Hz.

The voltage selector switch forms an integral part of the IEC mains inlet on the rear of your unit. Figure 3.4 depicts the integral mains inlet and voltage selector and shows the unit closed and open.

It can only be opened when the mains power is not connected.

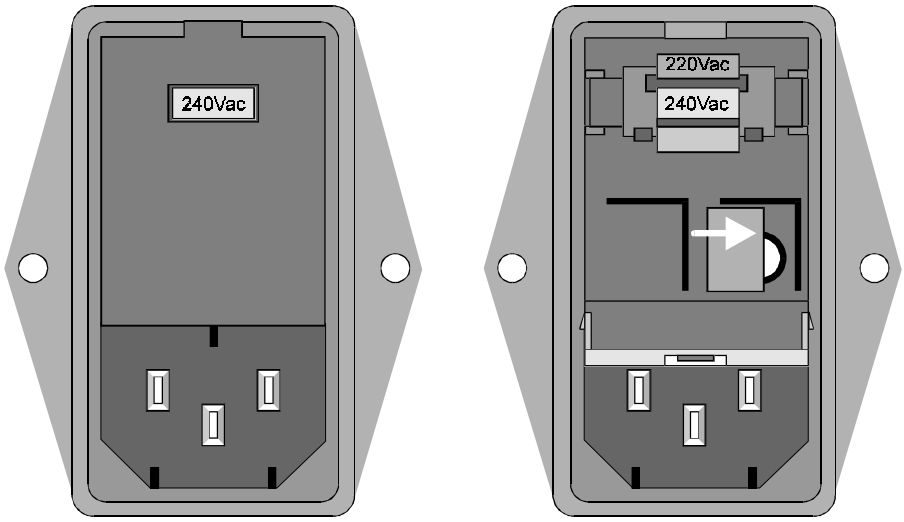


Figure 3.4 The integral mains inlet, voltage selector and fuse housing

The selector is marked with the nominal value for each of the four ranges defined above, the selected voltage range is visible through the compartment lid.

To gain access to the voltage selector or fuse:

1. First remove the mains supply.
2. Using a medium size flat bladed screwdriver, lever open the compartment that holds the selector drum and fuse.
3. With the compartment open, remove the selector drum and re-fit it in the desired position. The selected supply voltage setting will show when the cover is replaced.
4. To replace a fuse, lever the holder forward and replace the fuse with one of the correct rating (see below) then slide the holder back into the casing. make sure that the arrow points in the direction shown in Figure 3.4.

Always check that the fuse is of the correct rating and is the anti-surge type, do not automatically assume that the blown fuse which you are replacing was the correct current rating and type!

The maximum power consumption of the unit is 25 VA.

Mains inlet fuse ratings (Anti-surge type, 20mm long) are:

a) 100V nominal 250mA
b) 120V nominal 250mA
c) 220V nominal 125mA
d) 240V nominal 125mA.

CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE AND RATING OF FUSE.

POUR EVITER LES RISQUES D'INCENDIE NE REMPLACER QUE PAR UN FUSIBLE DE MEME TYPE ET DE MEME AMPERAGE.

3.7 Front Panel Description

Figure 3.1 shows the front panel of your KBU 64, which carries signal indicators for each of the Kilostream and user interface connectors; a mains power indicator, status indicators for the ISDN channels; an alarm

led for each channel and two non-latching, push-button switches for manual backup operations.

3.7.1 USER and LINK indicators

The indicators for USER 1, LINK 1, USER 2 and LINK2 are similar, and reflect the signal activity on the 15-pin User connectors and Kilostream channels 1 and 2.

103/T	Lights to indicate the state of Transmit Data as being ON (SPACE) on the 15-pin connector.
104/R	Lights to indicate the state of Receive Data as being ON (SPACE) on the 15-pin connector.
108/C	Lights to indicate the state of Data Terminal Ready as being ON (SPACE) on the 15-pin connector. If in V11 operation this indicates the state of the Control circuit.
107/I	Lights to indicate the state of Data Set Ready as being ON (SPACE) on the 15-pin connector. If in V11 operation this indicates the state of the Indicate circuit.
114/S	Lights to indicate the state of Transmit Clock as being ON (SPACE) on the 15-pin connector. If in V11 operation this indicates the state of the Signal Element Timing circuit.
115	Lights to indicate the state of Receive Clock as being ON (SPACE) on the 15-pin connector.
105	Lights to indicate the state of Request To Send as being ON (SPACE) on the 15-pin connector. If in V11 operation this indicator is not used.
109	Lights to indicate the state of Data Carrier Detect as being ON (SPACE) on the 15-pin connector. If in V11 operation this indicator is not used.

3.7.2 ISDN and ALARM Indicators

These indicate the state of channels 1 and 2 on the ISDN and are:

Indicator	Channel state
B1 IN USE	Lights to indicate channel 1 on the ISDN is in use (is carrying a call).
B1 BACKUP	Lights to indicate channel 1 on the ISDN is in use for backup of your Kilostream channel 1 (USER 1 port is connected to the ISDN line and not to LINK 1 port).
B2 IN USE	Lights to indicate channel 2 on the ISDN is in use (is carrying a call).
B2 BACKUP	Lights to indicate channel 2 on the ISDN is in use for backup of your Kilostream channel 2 (USER 2 port is connected to the ISDN line and not to LINK 2 port).
ALARM 1	Lights to indicate that an alarm state, originating from channel 1, is being output to the rear panel ALARM port.
ALARM 2	Lights to indicate that an alarm state, originating from channel 2, is being output to the rear panel ALARM port.

3.7.3 POWER

Lights to indicate that the KBU 64 power circuits are receiving mains power and are functioning correctly. Under normal operating conditions, this indicator should be lit when mains power is connected.

Note that if the KBU 64 is not powered up, the internal pass through relays will connect the USER port to the LINK port. This will allow normal operation of the user's equipment, although the ISDN backup will not function.

3.7.4 BACKUP Buttons

Two non-latching switches, one for each channel are provided for manual backup and restoral. When pressed the KBU will attempt a backup call using the stored ISDN number(s). If pressed when a backup call is in progress, the KBU will restore the user onto the leased circuit, and release the ISDN call.

It is not advisable to use the backup button when the KBU is set for automatic backup or restoral as this causes operational conflict. If

desired the buttons can be disabled by software control, see section 4.13.11. The left-hand backup button is also used to reset the KBU 64 on power up (see section 4.4.1).

4.

Configuration Commands

4.1 Introduction

There are two ways you can gain access to, and alter the software configuration options on your KBU 64;

- by direct VT100 terminal access (local connection to the COMMAND port of your KBU 64)
- By Talkwire link (from a remote KBU 64 placing a call to another KBU 64, over the ISDN).

In this section we only refer to **local terminal access**, remote configuration is covered in more detail later in this manual.

Terminal connection requires that the KBU 64 COMMAND port is set to communicate at 9600 bit/s, no parity, 8 data bits, 1 start bit and 2 stop bits. Although the data rate of the port may subsequently be altered by software command.

The cable required between your VT100 terminal and KBU 64 should be a 'straight through' V24 cable with D type connectors as described in section 10.

4.1.1 Initial Command Screen

Having connected to the COMMAND port, powered ON both your terminal and the KBU 64, you will see the entry screen:

```
KBU 64 SD x.xx

1: Line inactive (clock)
2: Line inactive (clock)
1> _
```

"x.xx" displays the software version number of your KBU 64. The bottom line is the standard command line prompt.

All configuration and dialling commands are entered at similar command line prompts.

4.2 Command Structure

The command structure for configuration options within your Kilostream backup unit is very simple to use.

Based on a single command line, displaying the Kilostream channel to which the changes refer, the majority of command lines contains primary 'action to be taken' commands, followed by secondary 'required setting' commands. These are all terminated with carriage returns (shown as [CR] in the examples).

Important: All command lines must be terminated by a carriage return.

For example:

```
1> SET BACKUP AUTO[CR]
```

Where:

Syntax	Function
1>	The command line prompt for the Kilostream Channel 1. (The > is the channel suffix, 1> - Channel 1, >2 - Channel 2. Responses from the unit (such as error messages) are identified by: (colon), i.e. 1:, 2:)
SET	The command prefix used to prepare your KBU 64 for a configuration command (see section 4.5).
BACKUP	is the primary command indicating which parameter you will alter the configuration setting of.
AUTO	is the secondary command (the new configuration setting).

You can only issue **one** primary command on a single line, issuing multiple primary commands within a single line will return an error message.

4.3 Active Channel Command

Alters the active channel reference (the active channel is the channel which will be effected by all subsequent configuration commands).

The command line prompt indicates which of the channels is active:

1> indicates that B1 (channel using the LINK 1/USER 1 connectors on your KBU 64) is currently the active channel for commands

2> indicates that B2 (channel using the LINK 2/USER 2 connectors on your KBU 64) is currently the active channel for commands.

To alter the active channel enter '1' or '2' followed by [CR] i.e.:

1> 2[CR] alters the active channel from B1 to B2.

4.4 Default Configuration

Your KBU 64 has been shipped with factory default settings for each of the configuration options.

To display a status screen showing the current configuration settings for both the B1 and B2 channels, at the command line prompt, type:

1> STATUS[CR]

Note that as well as detailing your KBU 64 configuration settings, an activity status report on the ISDN and Kilostream lines is also displayed together with an indicator showing to which of these the USER interface is currently connected.

```
1> STATUS[CR]

                chan 1          chan 2
ANSWER          AUTO            AUTO
CONNECT         MAN             MAN
DISCONNECT      MAN             MAN
BACKUP          MAN             MAN
WINDOW          ON              ON
RESTORE         MAN             MAN
DATA RATE       64K             64K
PROTOCOL        SYNC            SYNC
CHARACTER       10              10
NETWORK         ISDN            ISDN
INTERFACE       X               X
TALKWIRE        DEAD            DEAD
LLINE           TALKWIRE        TALKWIRE
USER            LINE            LINE
ISDN            IDLE            IDLE
LINE            ACTIVE          ACTIVE
ALARM PORT      ON

    1> _
```

The above screen shows the factory default settings.

You can alter the default configuration settings. These alterations take immediate effect, and are automatically stored in battery backed RAM, remaining in memory during a power failure or when powering down the KBU 64.

4.4.1 Reset On Power-up to Default Configuration

Is achieved by powering up the KBU 64 while holding the left hand Backup button depressed. This will reset your unit to its factory default state (as supplied). This action also clears the non-volatile RAM of any altered data.

The COMMAND port and ALARM port will revert to factory set configurations.

4.5 Altering/Defining a Configuration Parameter Setting

The SET command must be used as a prefix to all configuration commands. For example:

```
1> SET BACKUP AUTO[CR]
```

Because this command is entered following the 1> prompt, it will only take effect on channel 1 of your KBU 64 (the USER 1 to LINK 1 Kilostream line). If a similar setting is required on channel 2, then the command line must be repeated at the 2> prompt.

If you omit the SET command, an error message will be displayed.

4.6 Enabling/Disabling the KBU 64 Help Messages

Your KBU 64 software is equipped with many HELP messages that can be displayed at the terminal. These are designed to be informative and to offer guidance to the required syntax and available parameters of any given command.

The HELP facility is normally enabled (default state), but it can be disabled (or re-enabled) by software command. Help messages are only ever displayed when a syntax error occurs in a command line.

To enable or disable these messages, type:

```
1> SET HELP xx[CR]
```

where

xx	is either ON (enabled) or OFF (disabled).

4.7 Setting the System Time, Date and Day

After correctly installing your KBU 64, one of the first configuration requirements will be to correctly set the system time, date and day of week.

To do this, at either the 1> or 2> prompt, type:

```
1> SET TIME hh:mm[CR]
```

where:

hh	represents the current time in hours (using a 24 hour clock).
mm	is the number of minutes past the hour.

The set time will be implemented as soon as you have pressed the carriage return key.

```
1> SET DATE dd/mm/yy[CR]
```

where:

dd	represents the day of the month (01 to 31)
mm	represents the month (01 to 12)
yy	represents the current year (e.g. 95)

This system date will be implemented as soon as you have pressed the carriage return key.

```
1> SET DAY xxx[CR]
```

where

xxx	is the first three letters of the current day of the week (i.e. mon, wed, thu)

This system day will be implemented as soon as you have pressed the carriage return key, terminating the command line.

4.7.1 Viewing the Current System Time, Date and Day

The current system time, date or day can be viewed by typing:

```
1> TIME[CR]
```

```
1> DATE[CR]
```

```
1> DAY[CR]
```

as required.

4.8 Defining the Line Characteristics

To enable compatibility with your DTE and Kilostream line operation, the actual line speed and data protocol of each of your USER ports (channels 1 and 2) must be correctly configured within the KBU 64.

The default settings for both channels 1 and 2 are set to operate synchronously at 64Kbit/s.

4.8.1 Altering the ISDN Line Protocol Definition

To see the current protocol setting of both channels of your KBU 64, issue the STATUS[CR] command at the command line prompt. Normally data protocol for traffic on both channels will be synchronous.

If the requirement for either of your DTEs is for asynchronous data, you must alter your KBU 64's configuration to reflect this.

Note that it may first be necessary to change the SPEED parameter to a speed which can be both synchronous and asynchronous (600 to 38k4bit/s), otherwise the asynchronous DATA setting parameter change will not be accepted by the KBU 64.

To alter the protocol setting of B1 (USER 1 to LINK 1):

```
1> SET DATA dddd[CR]
```

where:

`dddd` is either `SYNC` or `ASYNC.`

To alter the protocol setting of B2 (USER 2 to LINK 2), change the active channel from 1 to 2 (type 2[CR]) and repeat the previous command string.

4.8.2 Altering the ISDN Speed Definition - Rate Adaptation

To display the line speed of the active channel type:

```
1> SPEED[CR]
1:B1 data rate – 64K
```

If the data rate of either of your DTE ports (connected to LINK1, and USER 2) differs from that of your KBU 64's configuration, the configuration must be altered to reflect the actual speed.

To alter the line speed of B1 (USER 1 to LINK 1):

```
1> SET SPEED sss[CR]
```

where:

`sss` is the speed of your DTE port.

The available settings are:

300	300 - Asynchronous only
600	600 - 38K4 inclusive suitable for Asynchronous/synchronous communication
1K2	
2K4	
4K8	
9K6	
19K2	
38K4	
48K	≥48K - Synchronous only
56K	
64K	

Note that with leased circuit data or clock rates of less than 600bit/s, talkwire restoration cannot be achieved.

When calls are made to the USA or other destinations which are 56K, the NETWORK parameter must be set to SWITCH56. This is necessary to perform bit stuffing of bit 8, for the 56K local exchange carriers. See section 4.8.4 for the NETWORK parameter.

With older KBU 64 hardware (Issue F or previous), the available speeds are 9K6, 19K2, 64K. If using older units please refer to your Technical Support for advice.

WARNING: Incorrect setting of these channel speeds will have an adverse effect on the correct operation of your KBU 64.

4.8.3 Altering the Asynchronous Character Length

Asynchronous character lengths of 7, 8, 9, 10, 11 & 12 can be supported independently on each channel, the character length counting data, parity, start and stop bits.

The selected character length is displayed in the STATUS screen.

Typing;

```
1> CHAR[CR]
```

displays the selected character length.

To change the character length, use the `set char` command;

```
1> SET CHAR XX[CR]
```

sets the character length for a particular channel

where `XX` is 7, 8, 9, 10, 11 or 12 characters. The following are the possible combinations of word length possible:-

CHAR 7	5 data	no parity	1 stop
CHAR 8	5 data	no parity	2 stop
	5 data	1 parity	1 stop
	6 data	no parity	1 stop
CHAR 9	5 data	1 parity	2 stop
	6 data	no parity	2 stop
	6 data	1 parity	1 stop
	7 data	no parity	1 stop
CHAR 10	6 data	1 parity	2 stop
	7 data	no parity	2 stop
	7 data	1 parity	1 stop
	8 data	no parity	1 stop
CHAR 11	7 data	1 parity	2 stop
	8 data	no parity	2 stop
	8 data	1 parity	1 stop
CHAR 12	8 data	1 parity	2 stop

With older KBU 64 hardware (Issue F or previous), the available character length is a fixed 10 bits inclusive of start, stop and parity.

The factory default CHAR setting is 10 bits. When a channel is set for synchronous operation the CHAR parameter setting is ignored.

4.8.4 Altering the Network Type - NETWORK Parameter

The KBU 64 can make switched 56K data calls to the USA, either to another KBU 64, a Fivemere 6421 or another manufacturer's TA on a 'per channel basis'.

```
1> NETWORK[CR]
```

displays the current setting of this parameter for channel 1 (read Channel 2 by typing 2>).

```
1> SET NETWORK SWITCH56[CR]
```

sets the rate adaption framing to 7 bits, the eighth bit being set to a '1' (i.e. unused) for the 7 bit frame of the switched 56K networks utilised in the USA.

With this setting the only speed that can be supported is 56Kbit/s. The SPEED parameter must be set to 56Kbit/s on the channel concerned for correct operation. No other setting of the SPEED parameter is valid. It is not possible to pass control signal handling at 56Kbit/s to the USA due to there being no free bandwidth available.

This setting also affects the talkwire protocol as it also has to operate using a 7 bit framed octet. Only another KBU that has the same parameter set will be able to operate with talkwire control to a KBU 64 set this way.

Note that it is not necessary to change the SPEED parameter of another KBU 64 if only a Talkwire call is being made.

```
1> SET NETWORK ISDN[CR]
```

sets normal 8 bit rate adaption framing for 64K ISDN type networks as used in the UK and Europe.

The default setting is ISDN. If you are in doubt about use of this parameter, please contact your Technical Support for further information.

4.8.5 The User Rate Switch

The default setting is 'OFF'. The User Rate switch can be used to enable or disable the transmission of user rate information when a call is made to the network.

Type:

```
1> SET USERRATE ON[CR]
```

or

```
1> SET USERRATE OFF[CR]
```

to enable or disable the feature. Some TA's check user rate information, rejecting the call if they receive the user rate information incorrectly. If this occurs you should type:

```
1> USERRATE[CR]
```

to see the current setting, then switch the feature ON or OFF as required, using the syntax above.

4.8.6 LLINE - Options

'LLINE' allows the use of the leased line in three different ways when the KBU 64 has connected the user to the ISDN;

1. Talkwire
2. Loop
3. RXDATA

```
1> SET LLINE <OPTION>[CR]
```

where the option is:

1. TALKWIRE - Is the default option, using the line for remote access (Talkwire link) and integrity checking when set.
2. LOOP - By dialling up on the second channel, you can initiate a loop on the channel to be tested. This allows you to check the return of your own data (only during back-up mode). During restoral the loop will always be dropped when the leased line is in use (NORMAL Mode).

L00P - Can also be used when you always wish to detect your own data for purposes of restoral. You can set LOOP 'ON' permanently for this purpose, when it will automatically be dropped upon sending data.

3. RXDATA - when set, monitors the line for any transition. When 'RESTORE' is set to AUTO, an automatic restore is performed when a transition is detected, providing that transitions are still detected within both the DATALOSS and RESTORE time delay settings.

   However, it is necessary to set 'DELAY RESTORE' to a greater value than 'DELAY DATALOSS' for this to function (the default setting of 'DELAY DATALOSS' is 0 seconds). As the default setting for 'DELAY RESTORE' is 3 seconds, it may be necessary to set DELAY RESTORE set to a longer period depending on the required DATALOSS timeout (the acceptable range is 0 - 999 seconds).

4.9 Setting the USER Port Interface Characteristics (RA)

Both USER port interfaces must be set to CCITT 'X' type (X21 etc.) or 'V' type (V35 etc.) interface characteristics, using the RA command. By default these are defined as using the 'X' type characteristics.

To check the current setting for this parameter, from either command line prompt, type;

STATUS[CR].

The current definitions are shown on the "INTERFACE" line.

To alter the existing setting:

```
1> SET RA n[CR]
2> SET RA n[CR]
```

where

```
n  = X or V.
```

When set to X, control to indicate functions are transferred for speeds at or below 56Kbit/s. When set to V, this provides V24 or V35 control signal transfer facilities over the ISDN link for speeds at or below 56Kbit/s. These are RTS to remote DCD, and DTR to remote DSR.

Please see also section 4.8.4, for the setting of the NETWORK parameter, when 56K speed is set.

The physical link jumpers must also be set as explained in section 2.

When RA is set to V, both transmit and receive clocks must be present from the digital leased circuit, for a talkwire restoral to occur. With RA set to X, only the single clock 'S' is used.

4.10 Altering Command Port Speed

The COMMAND port is set to communicate at 9600 bit/s as factory default. The COMM command is used to alter the COMMAND port speed to ensure compatibility with your terminal:

```
1> SET COMM sss[CR]
```

where:

`sss` = Baud rate of 300, 1200, 2400, 4800 or 9600 bit/s.

4.11 Altering Alarm Port Speed

The ALARM command is used to set the ALARM port speed to ensure compatibility with any connected equipment.

The factory default setting is 2400 bit/s:

```
1> SET ALARM sss[CR]
```

where `sss` is the desired setting (300, 1200, 2400, 4800 or 9600bit/s)

4.12 Configuring Alarm Messages

4.12.1 Defining the Message Format

The LOG command is used to activate or de-activate the ALARM port, and define how message EVENTs are presented on both COMMAND and ALARM ports of your KBU 64.

Messages are of two types: either EVENTs or ALERTs;

EVENT messages are all messages, i.e. 'Dialling', 'Ringing', 'Answering' etc.

ALERT messages are user defined messages prefixed by the word 'ALERT'. Where these occur on the ALARM port, they also carry a time and date stamp.

The current setting of the LOG command can be viewed on the KBU 64 status screen (by typing `1` (or `2`)`>STATUS`). This is displayed on the ALARM PORT line.

To alter the current setting of the ALARM message format:

`1> SET LOG xx`[CR]

where

`xx` is `OFF`, `ON` or `ALERT`.

When set to `OFF`, no logging information will be sent to the ALARM port. All message EVENTs are sent to the command port.

When set to ON (factory default), all message EVENTs are sent to both the command and alarm ports.

When set to `ALERT`, only the occurrence of a user defined ALERT causes ALERT messages to be sent to the ALARM port. Both user defined ALERTs and also all message EVENTs are sent to the command port.

Set to `ALERT` must be used for polled network management (see section 8).

4.12.2 Defining ALERT Messages

The purpose of ALERT messages are to inform you of any significant change in activity within your KBU 64. Due to their format they can also be used for message handling by network management systems.

Individual ALERTs for each channel can be set on or off at the user's preference. Setting an ALERT to OFF will prevent that type of ALERT from being output to the command and alarm ports (depending also on how the LOG parameter is set - see the previous section)

To display the current setting of the ALERTs, from either command line prompt, type:

```
1> ALERT[CR]
```

Alert	Chan 1	Chan 2
ACTIVE	ON	ON
INACTIVE	ON	ON
CALL	ON	ON
BACKUP	ON	ON
RESTORE	ON	ON
ISDNPASS	ON	ON
ISDNFAIL	ON	ON
CONNECT	ON	ON
DISCONNECT	ON	ON
PASSWORD	ON	ON
CHANSTATE	ON	ON

To alter an Alert event, from the command prompt, type:

```
1> SET ALERT CALL xx[CR]
```

where

`xx` is `ON` or `OFF`.

In this example, we are altering the CALL ALERT status on channel 1, the status of all other ALERTs are altered in the same way. To alter the ALERT status on channel 2, switch the active channel to channel 2 and then repeat the command line.

Below is a description of the definable ALERTs:

ACTIVE	Indicates that the Kilostream line is operating correctly.
INACTIVE	Indicates that a Kilostream line failure has been detected.
CALL	An incoming ISDN call has been received.
BACKUP	Backup to the ISDN has been initiated.
RESTORE	Connection to the Kilostream line has been restored.
ISDNPASS	The ISDN line passed the periodic dial test.
ISDNFAIL	The ISDN line failed the periodic dial test.
CONNECT	The USER port has connected to the ISDN line.
DISCONNECT	The USER port has disconnected from the ISDN line and connected to the Kilostream line (LINK port).
PASSWORD	3 attempts have been made to enter an incorrect password.
CHANSTATE	The Channel status ALERT is produced when a 'B' channel or user port has been connected or disconnected:-

ALERT Channel status 1	Port disconnected, no 'B' channels in use.
ALERT Channel status 2	Port disconnected, one or more 'B' channels in use. *E.g.* a Talkwire call in progress.
ALERT Channel status 3	Port connected, one or more 'B' Channels in use.

4.13 Backup Initiation and Answering Configuration

The KBU 64s at each end of a Kilostream link will detect line failure independently. It is also possible that the leased circuit fails in one direction only.

If Kilostream backup operation is to be fully automatic, one unit must initiate the backup link (backup auto) and the other must answer it (answer auto).

To achieve the above both units need to have BACKUP and ANSWER set to AUTO, and in order to prevent call collision each will have the DELAY BACKUP timer set to a different value.

As with all commands that alter the configuration, backup initiation and answering configuration commands can only be issued after a 'SET' command.

The configuration settings for these commands have a direct effect on the backup operation of the KBU 64, dictating whether each operation occurs automatically or manually (manual being the default setting in all cases).

4.13.1 Storing Backup Telephone Numbers

The telephone number of the remote KBU 64 which will be used during backup of the Kilostream link is held in the 'STORE' parameter of your configuration.

Up to 99 telephone numbers (for each channel) can be stored in the directory for backup use. During an auto backup, the number configured in directory location 1 will be used to establish an ISDN call.

If this number is unavailable, the alternate redial facility will be invoked, sequentially trying the telephone numbers within the directory until a connection is established (see section 4.14 for a full explanation of the functionality of alternate redialling, and details of the configuration requirements).

If manual backup is initiated (see section 6) any one of the telephone numbers within the 99 directory locations can be used for the backup call.

```
1> SET STORE n xxxxx/yyyyy[CR]
```

where

n	represents a directory location (1 to 99), and
xxxxx	is the telephone number of a remote KBU 64 to which a call can be placed.
yyyyy	represents the sub-address number of the channel in the remote KBU. This field is optional and need not be part of the stored number string unless sub-addressing is used. The yyyyy field is from 1 to 5 alphanumeric user defined characters. (See section 4.19 for a description of sub-address usage.)

To display the telephone directory of the active channel, type:

```
1> STORE[CR]
```

This displays all directory locations with a phone number stored in them.

If you only wish to view part of the directory, say from directory location 3 to directory location 11, type:

```
1> STORE 3 11[CR]
```

If you want to view the number held at one particular location within the directory, for example the number at directory location 3, type:

```
1> STORE 3[CR]
```

4.13.2 Defining the BACKUP Mode

Backup is available in three modes:

MAN (Manual)

AUTO

WIN (Window)

In MANUAL, the factory default mode, you will be notified of a failure on the link together with it's cause. You must then initiate Backup manually from the command line prompt (see section 6).

In AUTO, your KBU 64 will automatically backup a failed Kilostream link on detection of a failure of that link. You will see the cause (e.g. loss of clocks, data loss or NTU) indicated at the terminal.

Refer to section 4.15 for details of how to configure the timers which trigger a backup call.

If set to WIN, backup will be enabled and disabled according to the time of day constraints. You can set this mode by entering the WINDOW parameter '`win`'. This setting only causes restriction of the available backup origination times, it does not restrict the KBU 64 answering an incoming call.

4.13.3 Setting the Backup Time Windows

Please note that the 'time windows' operation has changed considerably from software versions V4.24 or earlier.

The WINDOW facility is only used when the BACKUP parameter is set to WIN. This enables you to restrict the days, or time period within a day when your KBU 64 can initiate a backup to the ISDN line. Up to 4 backup times (or slots) can be set for each day as required.

The factory settings have the first slot on all days set to 00:00 24:00 and the remaining slots set to 00:00 00:00. This enables BACKUP on all days without any restriction.

To display the current time windows for each channel of your KBU 64 type:

```
1> WINDOW[CR]
```

```
Channel 1  Slot 1        Slot 2        Slot 3        Slot  4
           On     Off    On     Off    On     Off    On     Off
           **********    **********    **********    **********
Monday     00:00 24:00   00:00 00:00   00:00 00:00   00:00  00:00
Tuesday    00:00 24:00   00:00 00:00   00:00 00:00   00:00  00:00
Wednesday  00:00 24:00   00:00 00:00   00:00 00:00   00:00  00:00
Thursday   00:00 24:00   00:00 00:00   00:00 00:00   00:00  00:00
Friday     00:00 24:00   00:00 00:00   00:00 00:00   00:00  00:00
Saturday   00:00 24:00   00:00 00:00   00:00 00:00   00:00  00:00
Sunday     00:00 24:00   00:00 00:00   00:00 00:00   00:00  00:00
```

This display is specific to each channel. You must change the command line prompt to '2>' to display the channel 2 window settings.

```
1> SET WINDOW xxxy hh:mm HH:MM[CR]
```

where:

xxx	is the first 3 letters of the day of the week
y	is the window slot number (1 to 4)
hh:mm	is the time in hours and minutes when the backup is enabled, (on xxxday)
HH:MM	is the time in hours and minutes from which the backup becomes disabled, (on xxxday)

For example:

```
1> SET WINDOW MON1 08:00 13:00[CR]
```

This will restrict the possibility of using backup operation of the channel 1 leased circuit, to between 08:00 to 13:00 on Mondays. This has no effect on a backup request made on any day other than a Monday. You can use the same command procedure to action restrictions at other times on the same day, or other days of the week:

```
1> SET WINDOW MON2 14:00 19:00[CR]
```

This will provide the additional possibility of using backup operation of the channel 1 leased circuit, to between 14:00 to 19:00 on Mondays.

If you set both the 'hh:mm' and 'HH:MM' to 00:00 then that particular slot on that day will be turned off and not used. If you set both the

'hh:mm' and 'HH:MM' to 00:00 on all slots on a day, then backup will be completely disabled for that day.

If you set the 'hh:mm' to 00:00, and 'HH:MM' to 24:00 then on that day the backup will be enabled all day, ending at midnight unless the next day backup is enabled from 00:00. You can be put this into any of the window slots (1 to 4) but for reasons of clarity it is better in slot 1.

Here is an example of how time windows might be set:

Channel 1	Slot 1		Slot 2		Slot 3		Slot 4	
	On	Off	On	Off	On	Off	On	Off
	**********		**********		**********		**********	
Monday	00:00	06:00	09:00	18:00	21:30	24:00	00:00	00:00
Tuesday	00:00	24:00	00:00	00:00	00:00	00:00	00:00	00:00
Wednesday	00:00	24:00	00:00	00:00	00:00	00:00	00:00	00:00
Thursday	00:00	24:00	00:00	00:00	00:00	00:00	00:00	00:00
Friday	00:00	17:30	00:00	00:00	21:30	24:00	00:00	00:00
Saturday	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00
Sunday	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00

The above example allows backup on Monday from midnight to 6am, then from 9am to 6pm. Also from 9.30pm on Monday until Friday 5.30pm, then 9.30pm to midnight on Friday. No backup can occur on Saturday or Sunday.

Setting the RESTORE parameter to WIN ensures that backup is terminated whenever the end time of the window time slot is reached thus saving unwanted ISDN line costs.

4.13.4 Answering a Backup Call

Setting the ANSWER parameter to AUTO (factory default) will enable your KBU 64 to automatically answer an incoming call from the ISDN.

When MAN is set, you will be informed of an incoming call, but the call will not be answered until the ANSWER command is manually issued (see section 6).

When set to CLID, the KBU 64 will only answer a call from a KBU whose number matches one held in the CLID store locations of the answering unit (see section 4.13.5).

```
1> SET ANSWER xx[CR]
```

where

xx is AUTO, MAN or CLID

Answering an incoming call on the ISDN does not route the data path away from the Kilostream line. It is only used to set up the ISDN call.

The current setting of the ANSWER command can be viewed on the KBU 64's STATUS[CR] screen.

4.13.5 Configuring the Calling Line Identification Table

This feature enables you to save up to 99 (1 to 99) Calling Line Identification Numbers, for each of the two channels, in numbered store locations of your KBU 64.

If the ANSWER parameter of your KBU 64 is set to CLID, only calls from KBU 64s whose originating number matches one of those held in your KBU numbered store locations will be answered.

This provides a security feature within your network, ensuring a rogue call cannot connect to your ISDN line (This is normally an option which must be requested from the ISDN service provider).

```
1> SET CLID yy xxxx[CR]
```

where

yy	is the store location in which the CLID number is to be held (1-99)
xxxx	is the telephone number of the remote KBU 64 that is able to place an ISDN call to your unit.

To display CLID numbers of the active channel which have been stored under the calling line identification security system:

```
1> CLID[CR]
Stored B1 CLIDs:
1  0793123456
2  09901234311
   etc.
```

If you want to view a CLID number which has been stored in a specific location, add the number of that location after the CLID command:

```
1> CLID 26[CR]
Stored B1 CLID:
26      0123456789
```

To view the CLID numbers held within a range of store locations, follow the CLID command with the first and last numbers of the required range:

```
1> CLID 68 70[CR]
Stored B1 CLIDs:
68    1123455789
69    00211245541
70    0112245612
```

If you want to view stored CLID numbers of the non active channel (in this example, channel 2), first activate channel 2 followed by the CLID command.

```
2> CLID XX XX[CR]
```

4.13.6 Connecting the USER Port to an Answered Backup Call

When Talkwire is used (which is the normal use), the calling KBU 64 will issue commands to the called KBU 64 to connect it's USER port to the ISDN.

The CONNECT parameter should normally be set to MANual, as the incoming commands provide Talkwire controlled connection.

```
1> SET CONNECT xx[CR]
```

where

```
xx   is AUTO or MAN
```

When set to MAN (this is the factory default/normal state), Talkwire commands control the connection. During an automatic backup call, the remote unit will receive a connect command from the unit that is performing the backup. The TALKWIRE parameter must therefore be set to ON.

CONNECT should only set to AUTO in applications where the calling device is not a KBU 64 and therefore cannot respond to talkwire commands– contact your Technical Support for further information.

4.13.7 Disconnecting Data Transfer From the ISDN Line

When Talkwire is used (which is the normal use), the Talkwire commands control disconnection of the USER port from the ISDN. The DISCONNECT parameter must be set to MANual.

```
1> SET DISCONNECT xx[CR]
```

where

```
xx   is AUTO or MAN
```

When set to MAN (factory default/normal) Talkwire commands control the disconnection, and the TALKWIRE parameter must be set to ON.

DISCONNECT should only be set to AUTO in special applications – contact your Technical Support for further information.

Normally therefore, the DISCONNECT parameter should be set to MAN and the TALKWIRE parameter set to ON.

4.13.8 Restoring a Call to the Kilostream Link From the ISDN Line

AUTO parameter

Setting the RESTORE parameter to AUTO causes the KBU 64 to control automatic leased circuit verification and switching of the user back to the leased circuit.

Once the KBU has detected and checked the Kilostream link to be operational and safe for data it automatically re-connects the USER port to the Kilostream link, then hangs up the ISDN call. Data transfer now occurs over the Kilostream link. The Kilostream link then continues to be monitored again.

Automatic Talkwire restoration cannot occur if the SPEED parameter is set at 1K2bit/s or less.

```
1> SET RESTORE xx[CR]
```

where

`xx` is `AUTO`, `MAN` or `WIN`.

MANual parameter

When restore is set to MAN (the factory default), you will be informed when the Kilostream link is active once again, the ISDN call will not be disconnected, and data will not revert to the Kilostream link until manually initiated (see section 6).

WINdow parameter

When restore is set to WIN, the KBU will release the ISDN call and revert back to the digital leased circuit at the window end time, if the leased circuit is still detected as inactive at that time.

RESTORE WIN can only be used with BACKUP set to WIN or MAN, and is invalid with BACKUP set to AUTO, due to an operational conflict which can be created.

With RESTORE set to AUTO or WIN, the three factors that are used for determination of restoral are

- successful talkwire (with talkwire set ON; see also section 4.15.11) and
- presence of clocking (see section 4.15.9) and
- presence of NTU (DSR or I signal) (see section 4.15.8)

If any of these are disabled, then restoral will occur without checking for them.

4.13.9 Using C/DTR

C/DTR configures the received control signal C/DTR on the USER port of the KBU 64. 'C' (Control) is used for an X21 interface, and 'DTR' is used for a V28 or V35 interface.

```
1> SET C/DTR xx[CR]
```

where

xx	is NORMAL, FORCED, ANSWER or BACKUP

When set to NORMAL, the USER supplied C/DTR signal is used by the KBU 64. This is usually used only for speeds below 64Kbit/s, where control signal handling is provided.

When set to FORCED, the C/DTR signal is internally forced to the active state, and the USER signal is ignored. The default setting is FORCED.

This is the recommended setting for all applications.

When set to ANSWER, the KBU 64 will only answer an incoming ISDN call if the C/DTR signal is active. This can be useful in preventing calls when, for example a computer port becomes inactive.

When the KBU 64 is set to BACKUP, it will initiate a backup call when the C/DTR signal becomes active. The call will be maintained until the C/DTR signal is dropped. This option is useful where a computer port controls backup initiation.

4.13.10 Using I/DSR

I/DSR configures the output control signal I/DSR on the USER port. 'I' (Indicate) is used for an X21 interface, and 'DSR' is used for a V28 or V35 interface.

```
1> SET I/DSR xx[CR]
```

where

xx is NORMAL or FORCED

For speeds below 64Kbit/s, control signals are transferred across the ISDN backup link, and the output of I/DSR to the USER port is dependent on the C/DTR input at the remote KBU 64.

When set to NORMAL, I/DSR is dependent on C/DTR at the remote KBU 64.

Where control signals are not transferred, the I/DSR output signal is inactive.

When set to FORCED, the I/DSR signal is always active during an ISDN backup.

This is the default setting and it is recommended for all applications.

4.13.11 Front Panel Backup Buttons

The front panel buttons provide manual control of back up and restoration of each channel.

When a button is pressed the relevant channel will attempt a backup call. If the button is pressed again while the backup call is in progress, the ISDN line will be dropped and the KBU will attempt line restoration.

Successful backup and restoration will depend on the dedicated line status together with other parameter settings such as BACKUP, RESTORE and some delay settings.

```
1> SET BUTTON xx[CR]
```

where

xx is OFF or ON

The factory default for this parameter is ON.

4.14 Using the Alternate Number Redialling Facility

We have already explained in section 4.13.1 that the telephone number of the remote KBU 64 is held in the STORE parameter of your KBU's configuration.

Alternate redialling is automatically initiated if BACKUP is set to AUTO.

Alternate redialling is also initiated automatically during manually entered `BACKUP[CR]` or `DIAL[CR]` commands when specific numbers or ranges of numbers have been defined in the command string. (see section 6 for details on manually initiated calls).

The telephone number in STORE directory location 1 will be the first one tried when your KBU 64 initiates a backup call. If this call is unsuccessful, the number will be retried a specified number of times, before the telephone number contained within directory location 2 is tried, and so on.

Once all of the numbers within the directory have been tried, the sequence will restart after a specified time period. This entire cycle will be repeated a specified number of times.

You can define the following time delays and cycles:

re-try Individual numbers - 1 to 99

number of cycles for the complete sequence - 0 to 99

time delay before repeating complete directory dialling (1 cycle)

Alternate redialling can be stopped by manually issuing the `HANGUP`[CR] command.

4.14.1 Defining the Number of Tries for each Telephone Number

The REDIAL command is used to define both the number of possible cycles, and the number of tries for each number:

```
1> SET REDIAL n m[CR]
```

where

`n` is the number of possible cycles, ranging from 0 (continuous) to 999

`m` is the number of times each telephone number will be tried before moving on to the next. Specified in the range from 1 (default) to 999.

Note: The time delays between an unsuccessful dial attempt and the next dial attempt, and that between the end and beginning of a cycle are user configured, as detailed in sections 4.15.13 and 4.15.14.

4.15 Configuring the Delay Timers

The SET DELAY command is used to configure the delay time (in seconds) settings for backup, restoral, Talkwire and Alarm commands. The factory defaults are:

```
1> DELAY[CR]

               chan 1     chan 2
ANSWER          3          3
BACKUP          3          3
RESTORE         3          3
CONNECT         3          3
DISCONNECT      3          3
TALKWIRE        5          5
ALARM           0          0
NTU             0          0
CLOCKLOSS       1          1
ALERT           0          0
TWDATA          3          3
DATALOSS        0          0
DIAL            1          1
REDIAL          1          1
PASSWORD       60         60

1> _
```

4.15.1 ANSWER Timer

When ANSWER has been set to AUTO, you can define the delay period before your KBU 64 will answer an incoming call:

```
1> SET DELAY ANSWER xxx[CR]
```

where

xxx is the time in seconds (0 to 999).

4.15.2 BACKUP Timer

If BACKUP is set to AUTO, the backup timer sets the KBU's delay period before it automatically dials the backup number, and switches the data traffic to the ISDN line:

```
1> SET DELAY BACKUP xx[CR]
```

where

xxx is the time in seconds (0 to 999).

4.15.3 RESTORE Timer

If RESTORE is set to AUTO, the restore timer sets the KBU's delay period before it terminates the ISDN connection, and switches data traffic back to the restored Kilostream link (providing the circumstances that indicated a restored Kilostream link are maintained for this timer period):

```
1> SET DELAY RESTORE xx[CR]
```

where

xxx is the time in seconds (0 to 999).

Note: All delay parameters selected must indicate positive restoration of the Kilostream link, prior to restoration. During this RESTORE delay period, the link is continuously monitored for correct operation.

Any failure on the link during this wait period will revert data transfer to the ISDN line.

4.15.4 CONNECT Timer

This defines how long your KBU 64 will wait before connecting the USER port (data traffic) to the ISDN line, either under Talkwire control, or with CONNECT parameter set to AUTO.

```
1> SET DELAY CONNECT xx[CR]
```

where

xxx is the time in seconds (0 to 999).

4.15.5 DISCONNECT Timer

When DISCONNECT is set to MAN (default/normal) this timer is not used.

However, if DISCONNECT has been set to AUTO, this defines the time your KBU 64 will wait before disconnecting the USER port (data traffic) from the ISDN line:

```
1> SET DELAY DISCONNECT xx[CR]
```

where

`xxx` is the time in seconds (0 to 999).

4.15.6 TALKWIRE Timer

Defines the length of time your KBU 64 will wait for Talkwire to establish a link, before reverting to non-Talkwire operation:

```
1> SET DELAY TALKWIRE xx[CR]
```

where

`xxx` is the time in seconds (0 to 999).

Note: Talkwire will time out at the expiry of this delay period.

If this occurs during a backup call the ISDN call will be released and re-dialled again (with CONNECT parameter set to MANual).

4.15.7 ALARM Timer

This timer is not used.

4.15.8 NTU Timer

The KBU 64 monitors the control signal Indicate/Data Set Ready (I/DSR) on the LINK port, and initiates a backup to the ISDN line (when BACKUP is set to AUTO).

Backup immediately starts when the I/DSR signal goes LOW. The NTU timer defines how long the I/DSR signal must remain HIGH before restoration of the leased line circuit is initiated:

```
1> SET DELAY NTU xxx[CR]
```

where

xxx is the time in seconds (0 to 999).

A value of 0 (factory default) disables backup on detection of I/DSR going LOW on the LINK port.

Note: Only Kilostream NTUs operating at 9600 bit/s and below provide an indication of line quality via the DCD control signal. Therefore, the NTU delay timer has no effect on a Kilostream link which is operating at a higher data rate. It also depends on the type of cable that is used between the link ports and the Kilostream NTU, whether the DCD output is routed to DSR (for NTU loss detection). Please contact your Technical Support for further information.

4.15.9 CLOCKLOSS Timer

The KBU 64 monitors the incoming clock on the LINK port, and initiates a backup (if BACKUP is set to AUTO, or WIN) to the ISDN line if the clock fails. Any clock speed from 600Hz to 1.6MHz is detected as a valid clock.

Backup starts immediately clock failure is detected. The Clock loss timer defines how long the clock signal must be correct for, before restoration of the leased line circuit is initiated:

```
1> SET DELAY CLOCKLOSS xx[CR]
```

where

xxx is the time in seconds (0 to 999).

A value of 0 (factory default) disables backup on detection of clock loss on the LINK port.

4.15.10 ALERT Timer

When an alert condition occurs (see section 4.12), a control signal (DSR) is raised on the ALARM port for the period defined by this delay:

```
1> SET DELAY ALERT xx[CR]
```

where

xxx is the time in seconds (0 to 999).

A value of 0 (factory default) disables this facility.

4.15.11 TWDATA Timer

When an ISDN backup call is in operation the KBU 64 tests the leased line by using it's Talkwire protocol.

The TWDATA timer defines how long this test must be detected as running successfully, before the KBU 64 will accept that the leased line has been restored.

Providing that no other failure condition exists and the KBU 64 has been configured for automatic restoration, the KBU 64 will restore the USER data to the leased line and then drop the ISDN call:

```
1> SET DELAY TWDATA xxx[CR]
```

where

`xxx` is the time in seconds (0 to 999).

If set to 0 seconds, the link test will not be used and the KBU 64 will presume that the leased line can pass data.

4.15.12 DATALOSS Timer

The KBU 64 continuously monitors the data received on the link, when the USER data is running over the leased line.

The DATALOSS timer is reset when transitions are detected on the received data. When received data remains at a continuous HIGH or LOW for the duration of the DATALOSS time period, the KBU 64 assumes that the leased line has failed, and initiates an automatic backup (if BACKUP has been set to AUTO):

```
1> SET DELAY DATALOSS xxx[CR]
```

where

`xxx` is the time in seconds (0 to 999).

If the timer is set to 0 seconds, DATALOSS will not be used as a link failure detection method. It is also not used as a factor for restoral.

4.15.13 DIAL Timer

Defines the length of time your KBU 64 will take to redial following an unsuccessful ISDN call:

```
1> SET DELAY DIAL xxx[CR]
```

where

`xxx` is the time in seconds (0 to 999).

Note This DIAL timer is only used during alternate redialling of telephone numbers, as detailed in section 4.14.

4.15.14 REDIAL Timer

Defines the length of time taken by the KBU 64 between complete Alternate Re-dialling cycles:

```
1> SET DELAY REDIAL xxx[CR]
```

where

`xxx` is the time in seconds (0 to 999).

Note This REDIAL timer is only used during alternate redialling of telephone numbers, as detailed in section 4.14.

4.15.15 PASSWORD Timer

Defines the length of time that password entry is enabled. After the defined period, without any command port activity, the user is logged out. (See also section 4.20 on Password Protection.)

```
1> SET DELAY PASSWORD xxx[CR]
```

where

`xxx` is the time in seconds (0, or 5-999).

The value of 0 causes the password entry to never time out.

The default setting is 60 seconds.

4.16 Verifying the ISDN Line

The VERIFY command will initiate a test of the line using both channels; providing Talkwire is enabled for both channels (see section 7), and STORE directory location 1 has been configured to contain the telephone number of your backup line.

Type: `1> VERIFY`[CR]

to initiate a test of both channels of your ISDN link.

4.16.1 Automatically Testing the ISDN Line

The ISDNTEST command is used to set a time when the backup number will be dialled every day, providing Talkwire is enabled (see section 7), and the line verified.

From the appropriate command line prompt, type:

`1> SET ISDNTEST hh:mm`[CR]

where

`hh`	represents the time of the test in hours (using a 24 hour clock)
`mm`	is the number of minutes past the hour

To view the time at which the ISDN line will currently be tested, type:

`1> ISDNTEST`[CR]

To disable ISDNTEST, type:

`1> SET ISDNTEST`[CR]

4.17 FLASH Alarm LEDs

The FLASH command is used to select between flashing, or constantly lit front panel ALARM LEDs:

`1> SET FLASH xx`[CR]

where

`xx`	is ON or OFF.

With FLASH set to ON, the relevant front panel LED will flash to indicate that an alarm state is being output to the ALARM port.

Alternatively with FLASH set to OFF, the relevant front panel LED will be constantly lit, when indicating that an alarm state.

This facility does not affect the presentation of alarms or signals on the rear panel.

4.18 Displaying the Software Version and Product Variant of the KBU 64

To display the software version, product variant and hardware issue of your KBU 64, from either command line prompt, type:

```
1> VERSION[CR]
```

Issue F or previous hardware will not display the hardware issue.

4.19 Sub-addressed ISDN Line Configuration

This parameter sets the sub-address of a called channel. The sub-address is an additional number provided by the calling party and carried across the network to the called party. This enables the called party to route the call to a specific device which has this sub-address.

The KBU will recognize a calling sub-address if it matches a KBU channel sub-address and will route the call through to the user port with that address.

It is possible to have a sub-addressed calling number provided from the network, whether the ISDN line has a single number for both B channels or 2 separate numbers, one for each B channel.

In both cases the user port owning the sub-address will be called (irrespective of the ISDN B1 or B2 number called, if two numbers are supplied).

If two numbers are supplied, the same ISDN number cannot be called again if a call is active using that number.

To set the channel sub-address, type:

```
1> SET ADDRESS XXXXX[CR]
```

where xxxxx is from 1 to 5 alphanumeric characters.

To display the sub-address number that has been set type:

```
1> ADDRESS[CR]
```

To remove the sub-address number, type:

```
1> SET ADDRESS[CR]
```

4.20 Password Protection

Password Protection has been implemented in this version of software.

Typing:

```
1> PASSWORD[CR]
```

displays whether password protection is enabled or not (it is normally disabled.)

4.20.1 Setting and Entering the Password

To enable password protection, type:

```
1> SET PASSWORD[CR]
```

The response to this is

```
Enter Password:
```

You must then enter your password which must be from 5 to 20 alphanumeric characters, followed by a [CR]**.** Each character entered is echoed by a * on the command line.

The response to this is then;

```
Re-enter password for confirmation:
```

When you must re-enter the same password.

If this is successful the response is

```
Password accepted
```

You will now have full access to your KBU 64.

If you are not successful, the response will be:

```
Password mismatch - password disabled
```

You must now repeat the entry process.

When entry to a password protected KBU 64 is required, you simply enter the password (the command line will always prompt:

```
Enter password:
```

when password entry is needed for access to it).

When the password is changed on a password protected KBU 64 (using the `SET PASSWORD` command) the response to the second confirmation password entry is:

```
Password changed
```

4.20.2 Logging Out

To logout from password access, type

```
1> LOGOUT[CR]
```

You must enter the password every time when access to a password protected KBU 64 is required.

4.20.3 Remote Mode

When a KBU 64 accesses a remote KBU 64 which is password protected, the same command line and operation is presented in remote mode.

When a password is entered however, the password characters are echoed on screen, so caution needs to be used, especially in an insecure environment when entering a remote password.

If for whatever reason talkwire goes inactive during access to a remote password protected KBU 64, the user is logged out to the remote KBU 64. The password must be entered again for continued access. (Talkwire inactive could be for instance; call release, B channel errors, a backup call causing user connection to the ISDN B channel etc.).

4.20.4 Disabling Password Protection

This is done by entering one or more spaces on both the first and confirmation entries to the `Enter password:` prompt.

Password protection is then disabled.

4.20.5 Reserved Passwords

'Version', 'poll' and 'local' may not be used as passwords. 'Version' is the only command that can be issued with a password protected KBU 64 that is logged out; 'Poll' and 'Local' are reserved for management of local and remote units.

4.21 Multiple Subscriber Number ISDN Line Configuration

The Multiple Subscriber Number (MSN) is a facility provided by the carrier's network, which allows a range of exchange numbers to be used on the same ISDN line.

You can allocate one of these MSN numbers to each channel of your KBU 64. In this way a specific channel is identified with each incoming call. Typing:

```
1> SET NUMBER XXXX[CR]
```

will enable MSN on channel 1 where XXXX is from 1 to 21 characters, and is part or all of the incoming MSN.

If your ISDN line is configured as an MSN line it is imperative that the MSN number is set on both channels of the KBU 64, for incoming calls to be handled correctly. The incoming MSN number can be either just the last digit or several digits of the exchange number.

As a first step, always try setting just the last digit of one of your numbers into the NUMBER parameter. This is the operation of European Multiple Subscriber Numbering.

The default setting is MSN not set (there is no number present in the store). Typing:

```
1> SET NUMBER[CR]
```

will remove the channel MSN number.

Typing:

```
1> NUMBER[CR]
```

will display the MSN number which has been set.

An incoming call on a line configured for MSN will be routed to that particular channel if it matches the MSN on that channel.

If MSN is not set on either channel, then the call will be accepted by either channel, depending which 'B' channel is used.

If MSN is set on both channels and the incoming call does not match either, the call will be cleared and an 'Incompatible Destination' message sent back to the caller. This message can also occur if more than one digit is specified but only one digit is provided by the network.

4.22 USA Variant 7 Parameters

The following parameters are only available with Variant 7 for use in the USA (see section 2.5.1 for Variant selections).

4.22.1 Service Profile ID (SPID)

The American National (NI-1) ISDN (or Belcore standard) requires that the KBU 64 handles Service Profile Identification (SPID). The SPID uniquely identifies a particular set of subscription parameters assigned to the ISDN subscriber's Terminal Service Profile.

The SPID is a unique terminal number that can be recognised by the network provider. The SPID number that must be entered is from one to 20 digits, the last two digits must be in the range of 01 to 62.

Please check with your network provider for the SPID number that you require to enter.

To enter the SPID, type:

```
1> SET SPID XXXXXXXXXXXXXXXXXXXX[CR]
```

where XXXXXXXXXXXXXXXXXXXX is from 1 to 20 digits.

To display the SPID that has been set, type:

```
1> SPID[CR]
```

To clear a SPID that has been set, type:

```
1> SET SPID CLEAR[CR]
```

the SPID value will then be erased. If this command is entered, a new SPID value must be entered before the KBU 64 is used again.

A SPID value that has been set can of course be changed using the `SET SPID` command.

4.22.2 USA Switch Type

The KBU 64 can be set to operate with two kinds of public switch in the USA, as each switch requires slightly different signalling.

DMS-100 and AT&T 5ESS types are available with the following commands:-

To set the DMS-100 Switch Configuration, type:

```
1> SET SWITCH DMS[CR]
```

To set the AT&T 5ESS Switch Configuration, type:

```
1> SET SWITCH ATT[CR]
```

To display the switch type that has been set, type:

```
1> SWITCH[CR]
```

The default setting is DMS-100.

5.

Example KBU 64 Applications

5.1 Introduction

Your KBU 64 can be configured for many applications. In this section we show you examples of three typical applications, and list the configuration settings which would normally apply to them.

The typical applications chosen are:

1. Backup to a single Kilostream link (section 5.2)
2. Backup to dual Kilostream links (section 5.3)
3. Backup to dual Kilostream links at two sites (section 5.4)

5.2 Backup to a Single Kilostream Link

In a single 64Kbit/s synchronous Kilostream link application, it is necessary that when a failure of the link occurs, the failure is detected and backup automatically initiated via the ISDN.

The unit then monitors the faulty Kilostream, to which data is automatically restored once the link is functional and has been checked.

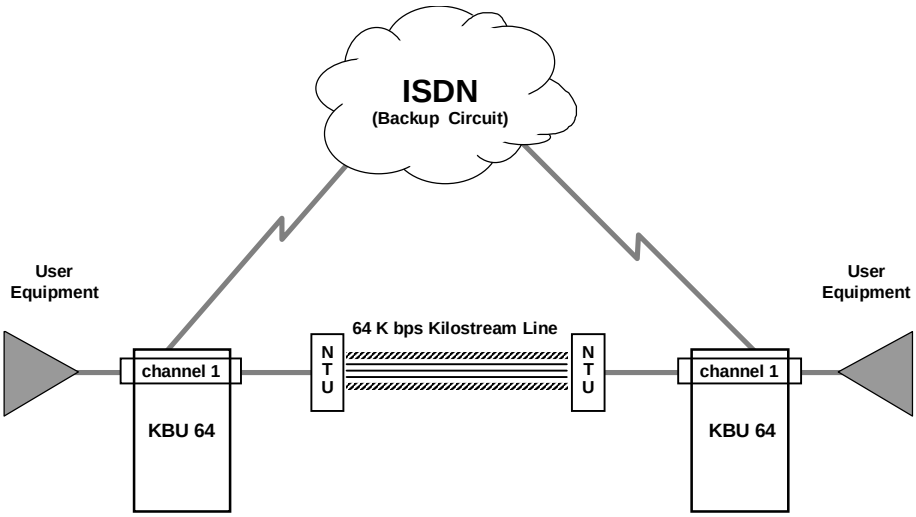


Figure 5.1 A Single Kilostream Backup Link

5.2.1 Single Link Configuration

Command	Unit A's channel 1	Unit B's channel 1
ANSWER	CLID	CLID
BACKUP	WIN	WIN
RESTORE	AUTO	AUTO
CONNECT	MAN	MAN
DISCONNECT	MAN	MAN
LOG	ALERT	ALERT
SPEED	64K	64K
COMM	9600	9600
ALARM	9600	9600
HELP	ON	ON
FLASH	OFF	OFF
TALKWIRE	ON	ON
RA	X	X
DELAY ANSWER	1	1
DELAY BACKUP	1	4
DELAY RESTORE	3	3
DELAY CONNECT	1	1
DELAY DISCONNECT	1	1
DELAY TALKWIRE	5	5
DELAY ALARM	1	1
DELAY NTU	0	0
DELAY CLOCKLOSS	3	3
DELAY ALERT	1	1
DELAY DATALOSS	3	3
CONSOLE	NORMAL	NORMAL
DATA	SYNC	SYNC
ALERT ACTIVE	ON	ON
ALERT INACTIVE	ON	ON
ALERT CALL	ON	ON
ALERT BACKUP	ON	ON
ALERT RESTORE	ON	ON
ALERT ISDNPASS	ON	ON
ALERT ISDNFAIL	ON	ON

Continued from previous page;

Command	Unit A's channel 1	Unit B's channel 1
ALERT CONNECT	ON	ON
ALERT DISCONNECT	ON	ON
C/DTR	FORCED	FORCED
I/DSR	FORCED	FORCED
ISDNTEST	13:00	18:00
BUTTON	ON	ON
NETWORK	ISDN	ISDN

Note: The CLID directories of each KBU 64 must contain the ISDN telephone number for channel 1 of the other KBU 64.

The STORE directory of each KBU 64 must hold (in directory location 1) the ISDN telephone number and the sub-address (if this is used) of channel 1 of the remote KBU 64.

Backup will only be enabled between the times set within the backup WINDOW.

5.3 Backup to Dual Kilostream Links

In a dual 64Kbit/s synchronous Kilostream link application, it is necessary that when a failure of the link occurs, the failure is detected and a backup is automatically initiated via the ISDN.

The unit then monitors the faulty Kilostream, to which data is automatically restored once the link is functional and has been checked.

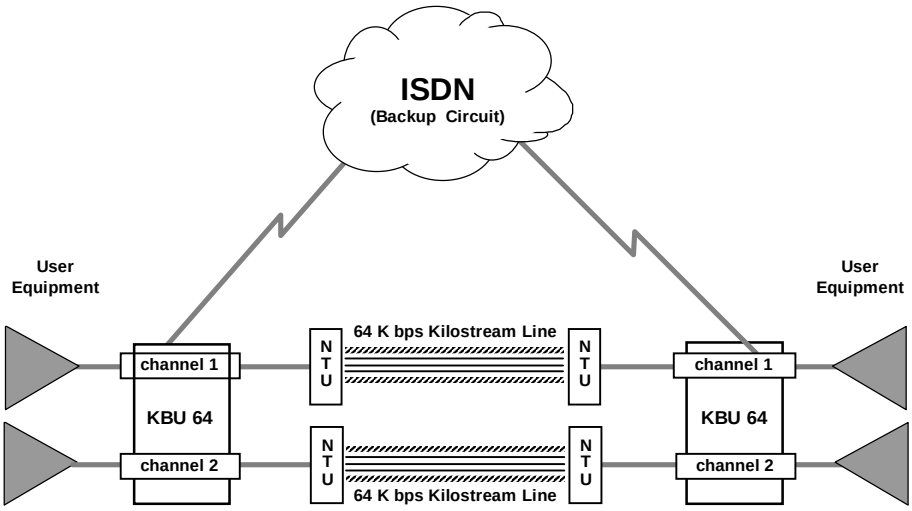


Figure 5.2 Dual Kilostream Backup Link

5.3.1 Dual Link Configuration

Command	Unit A's ch 1	Unit A's ch 2	Unit B's ch 1	1Unit B's ch 2
ANSWER	CLID	CLID	CLID	CLID
BACKUP	WIN	WIN	WIN	WIN
RESTORE	AUTO	AUTO	AUTO	AUTO
CONNECT	MAN	MAN	MAN	MAN
DISCONNECT	MAN	MAN	MAN	MAN
LOG	ALERT	ALERT	ALERT	ALERT
SPEED	64K	64K	64K	64K
COMM	9600		9600	
ALARM	9600		9600	
HELP	ON		ON	
FLASH	OFF		OFF	
TALKWIRE	ON	ON	ON	ON
RA	X	X	X	X
DELAY	1	1	1	1
ANSWER				
DELAY	1	1	4	4
BACKUP				
DELAY	3	3	3	3
RESTORE				
DELAY	1	1	1	1
CONNECT				
DELAY	1	1	1	1
DISCONNECT				
DELAY	5	5	5	5
TALKWIRE				
DELAY ALARM	1	1	1	1
DELAY NTU	0	0	0	0
DELAY	3	3	3	3
CLOCKLOSS				
DELAY ALERT	1	1	1	1
DELAY	3	3	3	3
DATALOSS				
CONSOLE	NORMAL		NORMAL	
DATA	SYNC	SYNC	SYNC	SYNC

Continued from previous page:

Command	Unit A's ch 1	Unit A's ch 2	Unit B's ch 1	Unit B's ch 2
ALERT ACTIVE	ON	ON	ON	ON
ALERT INACTIVE	ON	ON	ON	ON
ALERT CALL	ON	ON	ON	ON
ALERT BACKUP	ON	ON	ON	ON
ALERT RESTORE	ON	ON	ON	ON
ALERT ISDNPASS	ON	ON	ON	ON
ALERT ISDNFAIL	ON	ON	NO	ON
ALERT CONNECT	ON	ON	ON	ON
ALERT DISCONNECT	ON	ON	ON	ON
C/DTR	FORCED	FORCED	FORCED	FORCED
I/DSR	FORCED	FORCED	FORCED	FORCED
ISDNTEST	13:00	13:15	18:00	18:15
BUTTON	ON	ON	ON	ON
NETWORK	ISDN	ISDN	ISDN	ISDN

Note: The CLID directories of each KBU 64 must contain the ISDN telephone number of the corresponding channel on the remote KBU 64.

The STORE directory of each channel on each KBU 64 must contain the ISDN telephone number and the sub-address (if this is used) of the corresponding channel of the remote KBU 64, in directory location 1.

Backup will only be enabled between the times set within the backup WINDOW.

5.4 Backup to Dual Kilostream Links at Two Sites

In a dual 64Kbit/s synchronous Kilostream link application, it is necessary that when a failure of the link occurs, the failure is detected and a backup is automatically initiated via the ISDN.

The unit then monitors the faulty Kilostream, to which data is automatically restored once the link is functional and has been checked.

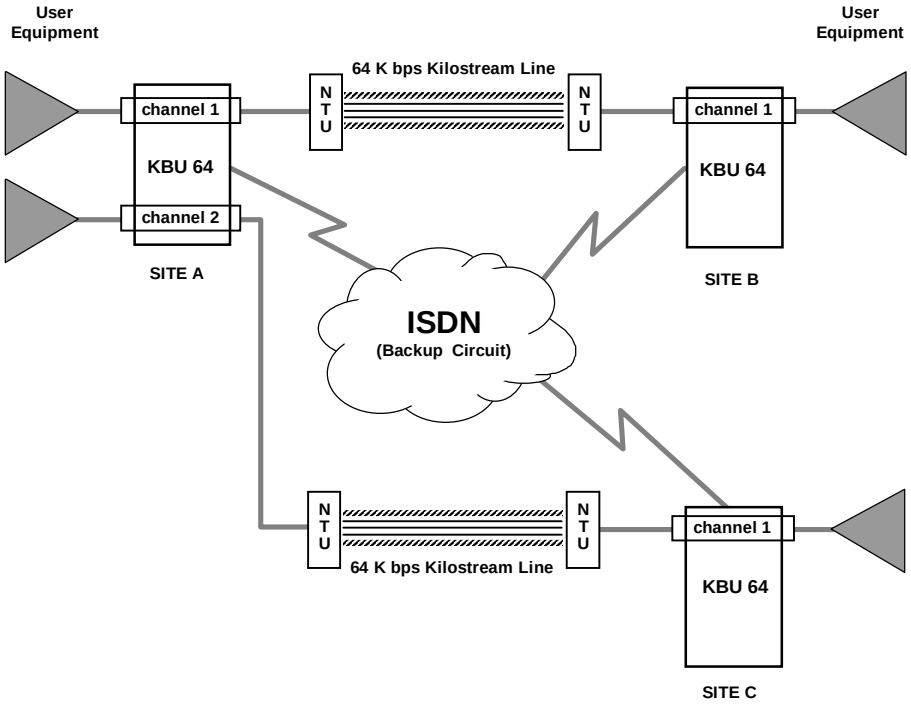


Figure 5.3 Dual Kilostream Backup Link to Two Sites

5.4.1 Dual Link to Two Sites Configuration

Command	Unit A's ch 1	Unit A's ch 2	Unit B's ch 1	Unit C's ch 1
ANSWER	CLID	CLID	CLID	CLID
BACKUP	WIN	WIN	WIN	WIN
RESTORE	AUTO	AUTO	AUTO	AUTO
CONNECT	MAN	MAN	MAN	MAN
DISCONNECT	MAN	MAN	MAN	MAN
LOG	ALERT	ALERT	ALERT	ALERT
SPEED	64K	64K	64K	64K
COMM	9600		9600	
ALARM	9600		9600	
HELP	ON		ON	
FLASH	OFF		OFF	
TALKWIRE	ON	ON	ON	ON
RA	X	X	X	X
DELAY ANSWER	1	1	1	1
DELAY BACKUP	1	1	4	4
DELAY RESTORE	3	3	3	3
DELAY CONNECT	1	1	1	1
DELAY DISCONNECT	1	1	1	1
DELAY TALKWIRE	5	5	5	5

Continued on next page:

Continued from previous page:

Command	Unit A's ch 1	Unit A's ch 2	Unit B's ch 1	Unit C's ch 1
DELAY ALARM	1	1	1	1
DELAY NTU	0	0	0	0
DELAY CLOCKLOSS	3	3	3	3
DELAY ALERT	1	1	1	1
DELAY DATALOSS	3	3	3	3
CONSOLE	NORMAL		NORMAL	
DATA	SYNC	SYNC	SYNC	SYNC
ALERT ACTIVE	ON	ON	ON	ON
ALERT INACTIVE	ON	ON	ON	ON
ALERT CALL	ON	ON	ON	ON
ALERT BACKUP	ON	ON	ON	ON
ALERT RESTORE	ON	ON	ON	ON
ALERT ISDNPASS	ON	ON	NO	ON
ALERT ISDNFAIL	ON	ON	ON	ON
ALERT CONNECT	ON	ON	ON	ON
ALERT DISCONNECT				
C/DTR	FORCED	FORCED	FORCED	FORCED
I/DSR	FORCED	FORCED	FORCED	FORCED
ISDNTEST	13:00	13:15	18:00	18:15
BUTTON	ON	ON	ON	ON
NETWORK	ISDN	ISDN	ISDN	ISDN

Note: The CLID directories of each KBU 64 must contain the ISDN telephone number of the corresponding channel of the remote KBU 64.

The STORE directory of each channel of Site A KBU 64 must contain the ISDN telephone number of the corresponding channel of the remote KBU 64, in its directory location 1.

The STORE directories of channel 2 of Sites B and C are not used, however the STORE directory of channel 1, in each case, should contain the corresponding telephone number of Site A's channels.

Backup will only be enabled between the times set within the backup WINDOW.

6.

Manual Backup Commands

6.1 Introduction

Manual Backup commands offer you a wider choice of applications than simply a manual initiation of an automatic backup call.

Calls can be made to any telephone number on the ISDN, meaning data can be routed to any remote KBU 64 within the network.

The intended ISDN automatic backup path could be called up and checked, leaving data to pass over the Kilostream link.

All manual commands are issued at the standard command line prompt, and must be followed by a carriage return character (shown as [CR]).

Your KBU 64 issues responses to all backup and dialling commands, which are displayed on your screen and echoed to a local printer attached to the ALARM port (provided LOG is set to ON in your configuration).

6.2 Manually Initiated Backup to the ISDN Line

You can initiate Manual backup from the appropriate command line prompt by issuing the BACKUP command.

```
1> BACKUP[CR]
```

In our example backup is initiated on channel 1, using the telephone number stored in STORE directory location 1, to make a call over the ISDN. If the call is unsuccessful, alternate redialling is initiated as described in section 4.14. When the call has been answered, USER 1 port is connected to the ISDN line.

As an alternative, you can use a telephone number held within any STORE directory location as the backup number by typing:

```
1> BACKUP Nn[CR]
```

where

n is the STORE directory location of the required backup telephone number.

As another alternative, any telephone number can be used in conjunction with the BACKUP command, by fully specifying the number on the backup command line i.e.:

```
1> BACKUP 07931234567[CR]  or

1> BACKUP 07931234567/PORT1[CR]
```

if a sub-address is used.

6.3 Manually Dialling a Remote KBU 64

The DIAL command can be used to initiate a call over the ISDN to any remote KBU 64. The command is functionally the same as the BACKUP command, except that the KBU 64 will not automatically connect the USER port to the ISDN line (unless CONNECT is set to AUTO).

```
1> DIAL[CR]
```

In our example, an ISDN call is initiated on channel 1, using the telephone number stored in STORE directory location 1.

NOTE: If the remote KBU 64 that you are calling has ANSWER set to CLID, it will reject your call, unless your telephone number is one of those held in the remote KBU's CLID directory.

Alternatively, a telephone number held within a specified STORE directory location can be used as the number to dial. For example, typing:

```
1> DIAL Nn[CR]
```

where

n is the STORE directory location of the required telephone number.

As a further alternative, any telephone number can be used in conjunction with the DIAL command, by fully specifying the number on the dial command line:

```
1> DIAL 07931234567[CR] or
1> DIAL 07931234567/PORT1[CR]
```

if a sub-address is used

Note: If a call is initiated using one of the STORE directory locations, and the directory is emptied during a call attempt (the user erases all of the numbers after initiating a call) then the dialling attempt will be aborted.

On outgoing calls, if the call is not answered after the set ANSWER delay, plus 30 seconds, the call will be rejected.

6.4 Answering an Incoming ISDN Call

You will be informed on the terminal screen of any incoming call on the ISDN, which you can accept using the ANSWER command.

```
1> ANSWER[CR]
```

Answering an incoming call on the ISDN does not route the data path away from the Kilostream line. It is only used to initiate the ISDN link.

This command is normally used with the parameter ANSWER set to MANual.

6.5 Connecting the USER Port to the ISDN Line

Following DIAL or ANSWER commands, the CONNECT command is used to interrupt the Kilostream data path and re-direct data down the ISDN link, if the ISDN link is on-line.

```
1> CONNECT[CR]
```

This command is not needed for either manual or automatic backup calls.

6.6 Disconnecting the User Port from the ISDN Line

The DISCONNECT command is used to disconnect the USER port from the ISDN channel and revert data transmission to the Kilostream line.

```
1> DISCONNECT[CR]
```

Disconnecting the USER port from the ISDN link does not terminate the ISDN call. This requires a separate HANGUP command (see section 6.7) to be entered at the command line prompt before the ISDN call will be dropped.

6.7 Hanging-up an ISDN Call

The HANGUP command must be used to terminate an ISDN call following the DISCONNECT command.

```
1> HANGUP[CR]
```

6.8 Manually Restoring Data Traffic to the Kilostream Link

Issuing the RESTORE command disconnects the USER port from an ISDN call, and reverts data down the Kilostream link. The ISDN call is then automatically dropped.

```
1> RESTORE[CR]
```

7.

Talkwire Operation

7.1 Introduction

Talkwire is the name given to the communication protocol which enables remote control and configuration of a KBU 64 from the command terminal of your local KBU 64. You can do this, either by placing a call over the ISDN network to the remote unit, or by using the Kilostream link (if data is being routed over the ISDN line).

The four primary functions of Talkwire are:

1. Sending messages to the Command terminal screens of remote KBU 64s.
2. To check that a restored Kilostream link is correctly passing data.
3. Remote control of a KBU 64 from your local KBU 64.
4. During backup call to "handshake" with the called KBU64, before connecting the user to the ISDN.

7.1.1 Line Usage

When using Talkwire, there are three rules of KBU 64 operation which you should remember, to help you to understand the logic behind messages returned to your terminal screen;

1. TALKWIRE must be set to ON at both ends of the required link.
2. Your KBU 64 is a dual channel device, serving two separate Kilostream links, each with an ISDN backup channel. Talkwire can operate over the ISDN or the Kilostream link, but can not use the same path being used to transmit user data. Both channels within your KBU 64 have Talkwire capability, both can simultaneously be using a Talkwire session if Talkwire is set to Local mode, however, only one Talkwire session can be enabled when using Remote mode. Treating each channel separately, if data is being passed over the Kilostream link of channel 1 a Talkwire call can only be dialled over the ISDN. If USER 1 is connected to the ISDN, then Talkwire can only be used on the Kilostream link, and only if the link is operational.
3. A Talkwire call (over the ISDN) can only be answered by a remote KBU 64 if the ANSWER parameter of the remote unit is set to AUTO. By default, the ANSWER parameter is set to AUTO.

   Alternatively, if the ANSWER parameter is set to CLID, the call will be accepted if the CLID of the remote KBU, matches the ISDN number of the channel from which you are placing the call.

   The connect parameter must be set to MAN at both the local and remote KBU 64s, if you do not wish to re-direct the data path away from the Kilostream line during a talkwire call.

7.2 Enabling / Disabling the Talkwire Facility

By default, the Talkwire facility is enabled. To enable or disable Talkwire on a given channel, from the command line prompt of the required channel, type:

```
1> SET TALKWIRE xx[CR]
```

where:

`xx` is '`ON`' or '`OFF`'

Note: When Talkwire is enabled, the KBU 64's STATUS[CR] screen will display TALKWIRE as either DEAD or ACTIVE.

DEAD indicates that the facility is enabled but a talkwire session is not in progress (no data path).

ACTIVE indicates that the facility is in use (backup is in progress, or remote diagnostics are initiated).

7.3 Initiating a Talkwire Call

Let us assume that TALKWIRE is set to ON for both channels of your KBU 64 and that the USER ports are connected to the Kilostream lines (for data transmission), also the CONNECT parameter is set to MAN.

At the channel prompt from which you wish to initiate the call (1 or 2), type:

```
1> DIAL xxxxxxx/yyyyy[CR]
```

where:

xxxxxxx is the ISDN line number of the remote unit

and

yyyyy is the ISDN sub-address number of the remote unit (if sub-addressing is used).

Providing that the link is successfully completed, the messages displayed at the local terminal will read:

```
1:  DIALLING xxxxxxx
1:  RINGING
1:  ONLINE
1:  TALKWIRE ACTIVE (V2+)
```

During this dialling sequence, the terminal operator of the remote KBU 64 will be notified of the incoming call, and the ISDN channel of his KBU on which the call is being received.

In our example the call was placed from channel 1 of the local KBU 64 to the ISDN number of channel 2 of the remote unit, you would see:

```
2:  INCOMING CALL xxxxxxx
2:  ANSWERING
2:  ONLINE
2:  TALKWIRE ACTIVE (V2+)
```

Note that the calling line ISDN number will only be presented if the network is providing the CLI. An unsuccessful Talkwire call will be identified by a screen message of:

```
1:  TALKWIRE TIMEOUT
```

This is displayed after the time set within the Talkwire Delay Timer has elapsed. Talkwire continues to be operative, trying to establish the connection. If the link becomes useable at any time, for any reason, a Talkwire connection will be established at that time. If after initially failing to establish a Talkwire link, you do not want Talkwire to continue trying, type:

```
1> SET TALKWIRE OFF[CR]
```

7.4 Using Talkwire to Send Messages

Your KBU 64 can be used to send messages to the screen of a remote KBU 64 terminal, via it's COMMAND port. With an active Talkwire link, and using the same example as above (dialled out on channel 1 to channel 2 of the remote unit), at the prompt, type:

```
1> SEND xxxxxx.........[CR]
```

where:

```
xxxxxxx........
```

is the message that will be displayed at the remote terminal.

7.5 Using Talkwire for Kilostream Testing

The Talkwire facility may also be used to monitor the state of a Kilostream link, after the data path has backed up to the ISDN line.

With Talkwire set to ON at both ends of the link, when the backup call is initiated (either automatically or manually) a Talkwire link will be made prior to issuing the CONNECT command to connect data to the ISDN line. You have already seen that a Talkwire link can only be operational on the opposite path to that used by the data traffic. Because of this, when the data is switched to the ISDN line, the Talkwire connection

switches to the Kilostream link, and continually transmits minimal data to try to establish a link to the remote unit. When the Kilostream link is repaired or restored, Talkwire is then able to make a satisfactory connection, indicating that the data link is up and passing data..

7.6 LOCAL Mode

An active Talkwire link has certain functions which enable you to command the actions of a remote KBU 64 without having full command of the remote COMMAND port. This state is called Local Mode.

Under non-Talkwire operating conditions, you have seen that CONNECT,

DISCONNECT, HANGUP and RESTORE commands, must be issued at both ends of a link (either automatically or manually). However, this is not the case if Talkwire is active.

If you issue any of these commands during a Talkwire session, the command will be actioned just as if it had been issued at both ends. The LOCAL command is also used to revert from Remote configuration, as detailed later in this guide.

7.7 REMOTE Mode

REMOTE is the Talkwire command which is used to gain access to the COMMAND port of the remote KBU 64, with which you have an active Talkwire link.

In this example: From the command line prompt;

```
1> REMOTE[CR]     the system responds;

 1:  REMOTE MODE ACTIVATED
A1:  REMOTE MODE REQUEST ACTIVATED

A1> _
```

The first line shows the command request being entered, from channel 1 of the local KBU 64, followed by a confirmation of the request.

The third and fourth lines are in fact an echo from the remote COMMAND port, confirming that it has received and actioned a remote request, and finally the command line prompt of the remote unit.

In this case the command line prompt is telling us that the remote command mode is active over the local KBU's channel A (1) and that we are currently at the command prompt for channel 1 on the remote KBU 64.

A prompt of A2> indicates the ISDN link is on channel A(1) of the local, and you are prompting channel 2 of the remote KBU.

A prompt of B1> indicates the ISDN link is on channel B (2) of the local, and you are prompting channel 1 of the remote.

A prompt of B2> indicates the ISDN link is on channel B (2) of the local, and you are prompting channel 2 of the remote.

All commands that you enter at one of these command line prompts, will be actioned by the remote KBU 64, just as if you were directly connected to it's COMMAND port.

All configuration commands of the KBU 64 are available to you.

Note: Take extreme care when using Talkwire to change the configuration of a remote unit, it is possible to alter a parameters which will result in locking yourself out of the unit, making further Talkwire connections impossible until the unit is re-configured from a local terminal!

7.8 Using Talkwire During a Backup

When the KBU 64 initiates a backup call, Talkwire can be set to ON or OFF, although it would normally be set to ON. When backup is initiated and Talkwire is set to OFF, the originating KBU 64 calls the remote KBU 64 over the ISDN line. On receiving the call, the remote unit answers and, after a predetermined delay, switches the user data from the Kilostream link to the ISDN line. The originating end will also switch (after a predetermined time), thus providing a backup data path over the ISDN.

The called KBU64 must have CONNECT set to AUTO, in order to connect the USER ports to ISDN with TALKWIRE set OFF. If Talkwire is set to ON, and a backup is initiated, the originating KBU 64 calls the remote KBU 64 over the ISDN line. On receiving the call, the remote unit detects a Talkwire sequence on the line, when it replies by sending a Talkwire sequence back to the originating KBU 64.

The originating unit, receiving a correct Talkwire sequence, sends a CONNECT command to the remote unit, which is acknowledged by the remote unit turning Talkwire OFF, and switching data traffic to the ISDN line.

The originating KBU 64 seeing Talkwire turned OFF, connects its USER port to the ISDN line, thus establishing a backup link. With the backup link established, Talkwire is inhibited over the ISDN, and the KBU 64 attempts a Talkwire connection via the Kilostream Link.

Note: If the unit does not detect Talkwire due to poor data transfer, the switch-over will be controlled by the settings for CONNECT, at each KBU 64.

With CONNECT set to AUTO, the remote KBU 64 will wait for the user defined time-out to expire and then initiate the switch. With CONNECT set to MAN, the ISDN call will be released, without switching the user to the ISDN. The call is then usually re-dialled if the REDIAL parameter allows.

8.

Polling Multiple KBU 64s

8.1 Introduction

Polling provides you with the ability to access the COMMAND ports of a number of KBU 64s, from a single command console.

Up to 4 KBU 64s can be connected to the command console via a Fivemere Port Sharer PSV4. These can be cascaded to provide support for a total of 999 KBU devices. Refer to your PSV4 User manual for details of the required connections.

Please see KBU 64 Rackmount User Manual 80-10100001 for details of polling with the rackmount version.

8.2 Hardware Strapping Requirements

When a KBU 64 is used in a polled environment the COMMAND and ALARM port link strapping must be altered from their normal positions:

COMMAND Port links	**Normal**	**Polled**	ALARM Port links	**Normal**	**Polled**
JP67			JP71		
JP66	IN	IN	JP70	IN	IN
JP65	OUT	IN	JP69	OUT	IN
JP64	IN	OUT	JP68	IN	OUT
JP60			JP62		
JP61			JP63		

8.3 Configuring the KBU 64s Polling Address

So that the COMMAND port of each of the polled KBU 64s can be individually addressed from the command console, each KBU 64 must be configured to have a unique polling address.

To do this, from either command line prompt, type:

```
1> SET POLL xxxxx[CR]
```

where

xxxxx represents the unique address, in the range 00001 to 99999.

This poll address should be noted, as the KBU 64 cannot be contacted without issuing the poll address.

If you are configuring KBU 64s that are already connected to the PSV (or the Manager Card in the rack), you must enable all the PSV or Manager card lockout switches except the KBU you wish to access. Once set to polled the lockout switch can be disabled for that KBU 64.

8.4 Configuring the Polled Command Mode

Having configured the KBU 64 to have a unique polling address, the command mode of the unit must be altered from its default state (normal) to reflect the new mode of operation. To do this, from either command line prompt type:

```
1> SET CONSOLE xxx[CR]
```

where

xxx is POLL, for a unit whose COMMAND port is connected to a Fivemere Port Sharer PSV4, or NORMAL, if the unit is controlled by a locally connected terminal.

8.5 Connecting to a Specific KBU 64 Within a Polled Environment

Having configured the CONSOLE parameter within your KBU 64 to POLL, access to the COMMAND port can only be gained by specifying the polling address of the unit.

For example, from the command console, type:

```
1> POLL 00001[CR]
```

or, where leading zeros exist as above, just:

```
1> POLL 1[CR]
```

to connect you to the COMMAND port of the KBU 64 whose polling address is set as 00001. Only KBU00001 will respond to the command, which is reflected by the command line:

```
00001 1> _
```

or

```
00001 2> _ for channel 2
```

To disconnect the console from this KBU 64's COMMAND port, type:

```
00001 1> POLL[CR]
```

Alternatively, you can switch to the COMMAND port of another polled KBU 64 by typing:

```
00001 1> POLL xxxxx[CR]
```

where

xxxxx	represents the polling address of the KBU 64 to which you will connect.

9.

KBU 64 Specification

Interfaces	Four 15-pin arranged as 2 female USER and 2 male LINK ports, for connection to two digital leased (Kilostream) circuits. Two V24 25-pin female connectors, CONTROL and ALARM, set to operate at 8 data bits no parity, 1 start and 1 or 2 stop bits. The CONTROL port is set for 9600 bit/s, the ALARM port for 2400 bit/s. One fixed line for connection to the ISDN 'S' interface ISDN-2
Dimensions	430mm wide x 65mm high x 285mm deep.
Supply voltage (switch selectable)	90V AC to 110V AC (100V Nominal) 108V AC to 132V AC (120V Nominal) 198V AC to 242V AC (220V Nominal) 216V AC to 264V AC (240V Nominal)
Consumption	30VA (Max)
Frequency	50/60Hz Nominal
Mains Inlet Fuse	20mm 125mA - for 220 & 240V ratings.
Anti-surge type	20mm 250mA - for 100 & 120V ratings.
Weight	4.5 kg
Environment	Ambient temperature: operating 0°C to 40°C storage 20°C to 70°C
Relative humidity:	5% to 95% non-condensing
Atmospheric pressure:	86.0 kPa to 106.0 kPa

10.

Cable Specification

10.1 ALARM or COMMAND

The cable required for connection to either the ALARM or COMMAND ports should be a straight pin to pin V.24/V.28 25-pin cable:

MALE D-Type	to	MALE D-Type
1	———	1
2	———	2
3	———	3
4	———	4
5	———	5
6	———	6
7	———	7
8	———	8
20	———	20

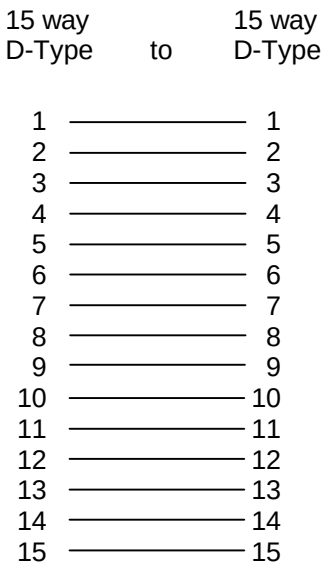
Cable part number CAB0025 is available.

10.2 V.11/X.21 USER and LINK

The cable required for connection to either the USER or LINK ports when configured for V11/X21 operation, should be a straight pin to pin 15-pin cable.

MALE to MALE between the USER ports and your data equipment,

MALE to FEMALE between your LINK ports and the NTUs:

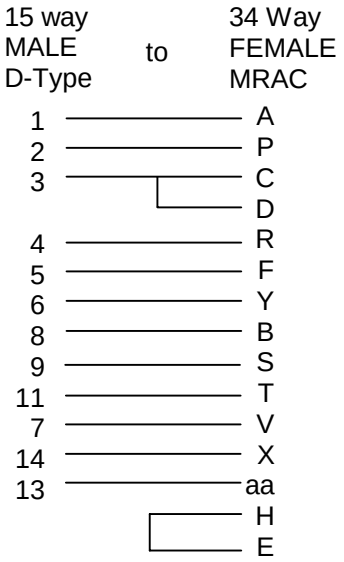


MALE to MALE Cable part number CAB0002 is available for the USER port links.

Male to Female Cable part number CAB0003 is available for the LINK port links.

10.3 V.35 USER

The cable required for connection between the USER port and your user equipment when configured for V35 operation, should be:



Cable part number CAB0007A is available.

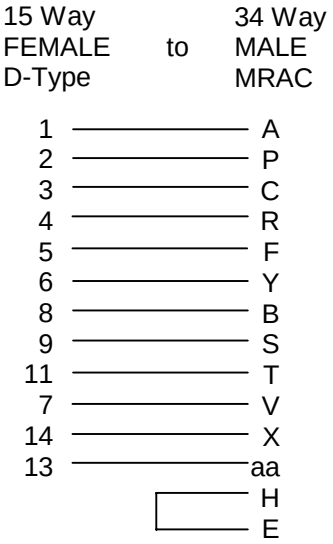
The output voltage levels of clocks and data from the KBU 64 are V11 level. An adaptor is available, CAB0023, to reduce the voltages to V35 levels.

All clock and data circuits must be twisted pairs.

If the control circuits are required to be routed independently, i.e. not looped as above, another cable CAB0030 is available. CAB0030 can only be used with Issue G or later hardware.

10.4 V.35 LINK

The cable required for connection between the LINK port and your NTU when configured for V35 operation, should be:



Cable part number CAB0008A is available.

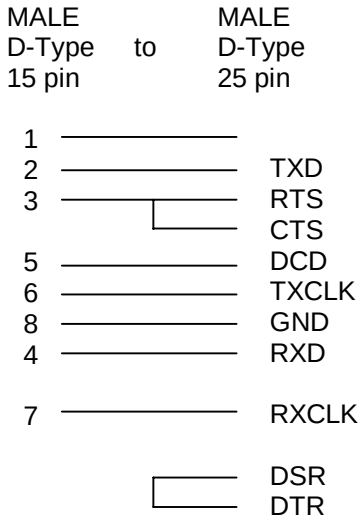
The output voltage levels of clocks and data from the KBU 64 are V11 level. An adaptor is available, CAB0021, to reduce the voltages to V35 levels.

All clock and data circuits must be twisted pairs.

If the control circuits are required to be routed independently, i.e. not looped as above, another cable CAB0031 is available. CAB0031 can only be used with Issue G or later hardware.

10.5 V.24 USER

The cable required for connection to the USER ports when configured for V28 operation, should be:

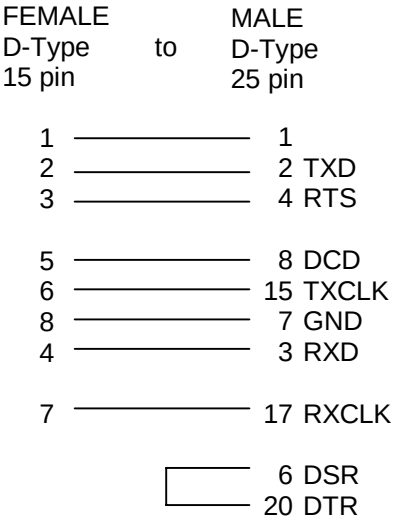


Cable part number CAB0026 is available.

If the control circuits are required to be routed independently, i.e. not looped as above, another cable CAB0032 is available. CAB0032 can only be used with Issue G or later hardware.

10.6 V.24 LINK

The cable required for connection to the LINK ports when configured for V28 operation, should be:



Cable part number CAB0027 is available.

If the control circuits are required to be routed independently, i.e. not looped as above, another cable CAB0033 is available. CAB0033 can only be used with Issue G or later hardware.

11.

Regulatory Requirements

11.1 United Kingdom and Europe

Users based in the United Kingdom and Europe must pay particular attention to the information contained in sections 11.1 and 11.2.

B.A.B.T. Pan European Approval number AA602163.

1. The KBU 64 is approved for connection to ISDN and X.21 leased circuit services provided by a European Public Telecommunications Operator.
2. Only connect apparatus complying with the requirements of SELV in accordance with clause 2.3 of EN 60 950 to the ports on the rear panel of your unit marked User 1, User 2, Link 1, Link 2, Command and Alarm.
3. Only connect apparatus complying with the requirements of TNV in accordance with clause 6.2 of EN 60 950 to the port on the rear panel of your unit marked ISDN 'S'.

11.2 Additional UK Requirements

1. All apparatus connected to the user ports and thereby connected directly or indirectly to the British Telecom circuits must be approved apparatus as defined in section 22 of the British Telecommunications Act 1984.
2. The interconnection cables detailed in section 10 form part of the approval and cabling itself constitute a relevant branch system for the digital circuits detailed below.

3. The KBU 64 is approved for direct connection to the X.21 and X.21 bis (V.35) or X.21 bis (V.28) Kilostream© provided by British Telecom PLC or any similar service provided by other British Telecommunications operators, or a relevant branch system for those digital circuits which accord to CCITT recommendations X.21 and X.21 bis.

   Where connection is made to circuits conforming to CCITT, X21 bis, Service Categories 1 and 2 are supported.

   For Service Category 1, data rates of 2.4 kbit/s to 19.2 kbit/s are available and connection is via an integral cable terminated with a 25 way D-Type connector conforming to BS 6623: Part 1: 1985.

   For Service Category 2, data rates of 48k, 56k and 64kbit/s may be used. Connection is via an integral cable terminated with a 34 pin connector conforming to BS 6623: Part 1: 1986.

4. If any other apparatus, including cabling or wiring is to be connected between the apparatus, and the point of connection to the digital circuits detailed in above, then all that other apparatus shall conform to the following:

   a) The overall transmission characteristics of all that other apparatus shall be such as to introduce no material effect upon the electrical conditions presented to one another by the apparatus and the digital circuit.

   b) All the other apparatus shall comprise only:

      i) apparatus approved (see note) for the purpose of connection between the apparatus and the digital circuit, and;

      ii) cable or wiring complying with a code of practice for the installation of apparatus covered by this standard

   or such other requirements as may be applicable.

   Note: Such apparatus may have been approved subject to limitations on its use.

11.3 USA Consumer Information and FCC Requirements

This equipment complies with Part 68 of the FCC rules. On the underside of this equipment is a label that contains, among other information, the FCC registration number. If requested, provide information to your telephone company.

If your KBU64 causes harm to the telephone network, the Telephone Company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice isn't practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.

Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper operation of your equipment. If they do, you will be given advance notice so as to give you an opportunity to maintain uninterrupted service.

If you experience trouble with your KBU64, please contact Cabletron Systems, 35 Industrial Way, Rochester, NH 03866 USA. Phone: (603) 332-9400, Fax: 603) 337-2211 for repair/warranty information. The telephone company may ask you to disconnect this equipment from the network until the problem has been corrected or you are sure that the equipment is not malfunctioning.

There are no repairs that can be made by the customer to the KBU64.

This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs. (Contact your state public utility commission or corporation commission for information).

FCC rules require that the following affidavit be completed by the installer and forwarded to the local exchange carrier:-

Affidavit for the Connection of Customer Premises Equipment to ISDN 64 Kbit/s.

For the work to be performed in the certified territory of

_____

Telco Name

State of _____, County of _____,

I,_____,

_____,

name *business address*

_____, being duly sworn, state:

telephone no.

I have responsibility for the operation and maintenance of the equipment to be connected to ISDN 64Kbits digital services. The terminal equipment to be connected complies with Part 68 of the FCC rules except for encoding analog content and billing protection specifications.

The digital CPE does not transmit digital signals containing encoded analog content or billing information which is intended to be decoded within the telecommunications network.

Signed: _____

_____

title

_____

date

Subscribed and sworn to before me

This_____ day of_____, 19_____

_____

Notary Public

My commission expires: _____

12.

PCB Link Options

Warning: access to the internal workings of your Kilostream backup unit is strictly denied to the user.

This section is supplied for reference only, and shows the factory default link settings.

USER and LINK interface link options are detailed in section 2 of this manual and are not repeated here.

JP1	ISDN interface definition, centre four pins fitted.
JP15	Relay isolator, fitted at all times.

12.1 COMMAND port links

JP60	Pin 1 to Signal Ground, not fitted
JP61	Pin 1 to Chassis Earth, fitted.
JP64	Loopback 105 from 106, fitted
JP65	Output circuit 106, not fitted
JP66	Generate 109 from 107, fitted
JP67	Generate 109 from 106, not fitted

12.2 ALARM port links

JP62	Pin 1 to Signal Ground, not fitted
JP63	Pin 1 to Chassis Earth, fitted.
JP68	Loopback 105 from 106, fitted
JP69	Output circuit 106, not fitted
JP70	Generate 109 from 107, fitted
JP71	Generate 109 from 106, not fitted

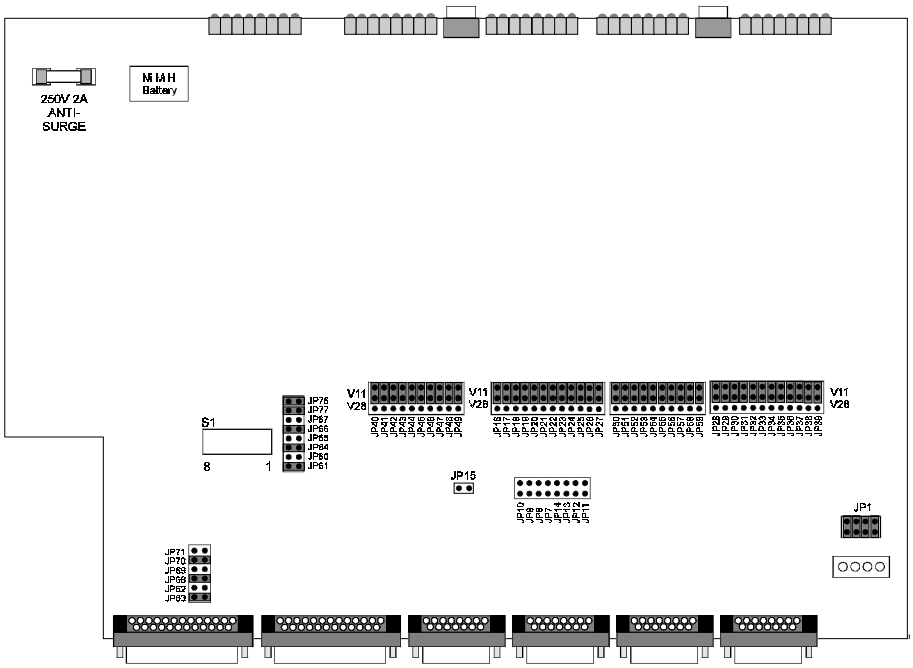


Figure 12.1 Position of PCB link options

13.

Connection and Disconnection

Electrical current from power, telephone and signal cables is potentially hazardous. Connect and disconnect cables as follows when installing, moving or opening the covers of attached devices.

To Connect: Turn everything OFF (including the branch circuit switch). Then connect in the following sequence:

1. All cables at the device
2. The remote end of the signal cables*
3. The power cable at the outlet
4. Then turn the branch circuit switch ON and set the device ON.

To Disconnect: Turn everything OFF (including the branch circuit switch). Then disconnect in the following sequence:

1. The power cable at the outlet**
2. The remote end of the signal cables
3. All cables at the device.

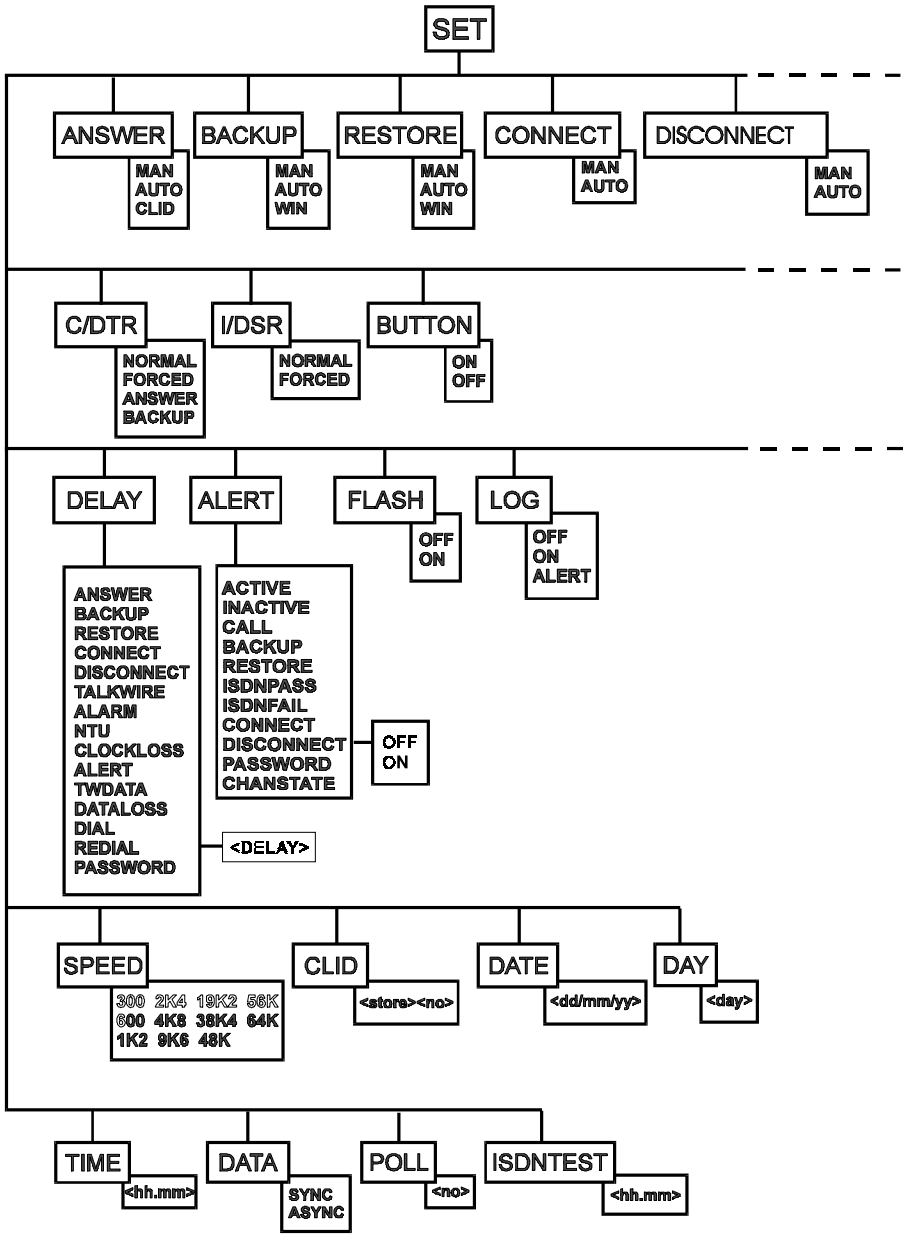
* In the UK, by law, the telephone line cable must be connected after the power cable.

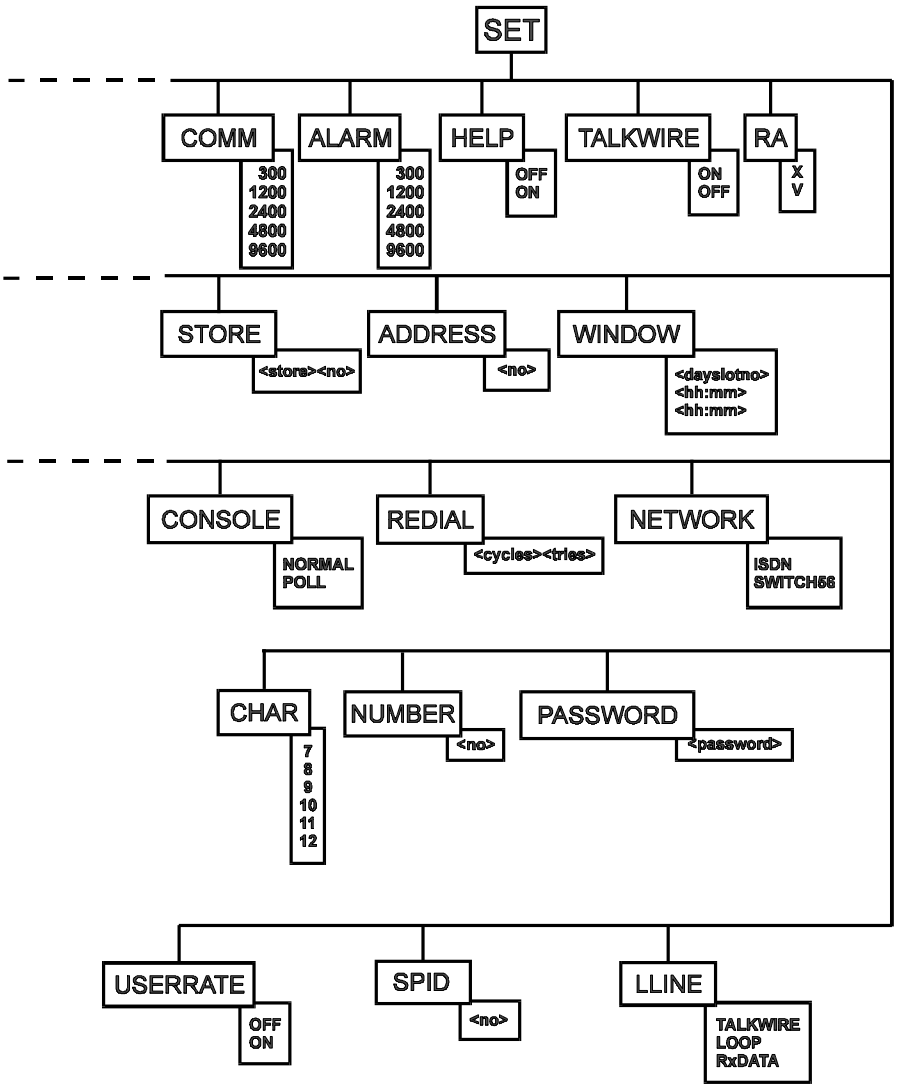
** In the UK, by law, the power cable must be disconnected after the telephone line cable.

14.

KBU 64 Command Map

1
2
ADDRESS
ALARM
ALERT
ANSWER
BACKUP
BUTTON
C/DTR
CHAR
CLID
COMM
CONNECT
CONSOLE
DATA
DATE
DAY
DELAY
DIAL
DISCONNECT
FLASH
HANGUP
HELP
I/SDR
ISDNTEST
LLINE
LOCAL
LOG
LOGOUT
NETWORK
NUMBER
PASSWORD
POLL
RA
REDIAL
REMOTE
REMOTE RESET
RESTORE
SEND
SET
SPEED
SPID
STATUS
STORE
TALKWIRE
TIME
VERIFY
USERRATE
VERSION
WINDOW


SET
ANSWER
MAN
AUTO
CLID
BACKUP
MAN
AUTO
WIN
RESTORE
MAN
AUTO
WIN
CONNECT
MAN
AUTO
DISCONNECT
MAN
AUTO
C/DTR
NORMAL
FORCED
ANSWER
BACKUP
I/DSR
NORMAL
FORCED
BUTTON
ON
OFF
DELAY
ALERT
FLASH
OFF
ON
LOG
OFF
ON
ALERT
ANSWER
BACKUP
RESTORE
CONNECT
DISCONNECT
TALKWIRE
ALARM
NTU
CLOCKLOSS
ALERT
TWDATA
DATALOSS
DIAL
REDIAL
PASSWORD
<DELAY>
ACTIVE
INACTIVE
CALL
BACKUP
RESTORE
ISDNPASS
ISDNFAIL
CONNECT
DISCONNECT
PASSWORD
CHANSTATE
OFF
ON
SPEED
300 2K4 19K2 56K
600 4K8 38K4 64K
1K2 9K6 48K
CLID
<store><no>
DATE
<dd/mm/yy>
DAY
<day>
TIME
<hh.mm>
DATA
SYNC
ASYNC
POLL
<no>
ISDNTEST
<hh.mm>


SET
COMM
300
1200
2400
4800
9600
ALARM
300
1200
2400
4800
9600
HELP
OFF
ON
TALKWIRE
ON
OFF
RA
X
V
STORE
<store><no>
ADDRESS
<no>
WINDOW
<dayslotno>
<hh:mm>
<hh:mm>
CONSOLE
NORMAL
POLL
REDIAL
<cycles><tries>
NETWORK
ISDN
SWITCH56
CHAR
7
8
9
10
11
12
NUMBER
<no>
PASSWORD
<password>
USERRATE
OFF
ON
SPID
<no>
LLINE
TALKWIRE
LOOP
RxDATA